An Address

ON

THE DEGENERATION OF THE NEURONE IN THE LIGHT OF RECENT RESEARCH,

ESPECIALLY IN RELATION TO SYPHILIS AND GENERAL PARALYSIS.

DELIVERED AT BIRMINGHAM AT THE INAUGURAL MEETING OF THE MIDLAND MEDICAL SOCIETY, SESSION 1913–14.

(*With Special Plate.*)

BY F. W. MOTT, M.D.LOND., F.R.C.P.LOND., F.R.S.,

PATHOLOGIST TO THE LONDON COUNTY ASYLUMS.

MR. PRESIDENT AND GENTLEMEN,—Allow me to thank you for inviting me to follow the long list of distinguished members of our profession who have had the honour of giving an address at the annual inaugural meeting of the Midland Medical Society. I must first ask your permission to extend the title of my address in order to limit the scope to a subject in which I have long been interested —namely, the relation of syphilis to the degeneration of the neurone, especially in general paralysis, which, owing to recent discoveries and the importance of the subject, particularly at the present time, necessitates a fuller discussion than other causes of degeneration of the neurone.

DEGENERATIONS OF THE NEURONE.

The term "neurone" implies a nervous unit—that is, a nerve cell and all its branches. The nervous system is made up of countless millions of nervous units, each one existing as an independent organism in contiguity but not in continuity. The neurones are genetically and trophically independent cellular organisms arranged in functionally correlated systems, communities, and constellations. There are two types of neurones, one in which the axis-cylinder process leaves the grey matter and acquires a medullated sheath—this is the first type of Golgi; the other, the second type of Golgi, in which the axis-cylinder process does not leave the grey matter. The nutrient and supporting tissues—namely, the blood vessels, lymphatics, and neuroglia tissue—make up the histological elements.

Degeneration of the neurone may occur from an inherent lack of durability of certain correlated functional systems, as occurs in certain diseases which affect members of families at the same age in life and often in generation after generation—for example, Huntingdon's chorea, hereditary ataxy. Degeneration of the neurone may result from direct injury, from local extension of inflammation or ischaemic softening due to obstruction of the blood supply by vascular occlusion; the degeneration that results therefrom is secondary. But when, for whatever cause, nervous tissue disappears, the neuroglia always reacts by a nuclear and fibrillar proliferation—a law formulated by Weigert in 1890. The replacement of the nervous tissue by the neuroglia tissue causes a "sclerosis." But it is hardly necessary to remind you that the term "sclerosis" in the sense of a neuroglia proliferation being the primary cause is incorrect; the sclerosis is the effect, not the cause. Certainly there is a primary gliosis due to embryonic tissue taking on active growth, but the destruction of the neurones in syringomyelia is not caused so much by the gliosis as by haemorrhages occurring in the glial tissue.

Now we recognize a certain number of primary degenerations of the nervous system characterized by insidious onset, progressive character, and a tendency sooner or later to a fatal termination, generally hastened by intercurrent disease or secondary microbial infections due to complications. I will put on the screen a slide to illustrate some of these primary degenerations. A pure primary decay of the neurone has been termed by Sir William Gowers "abiotrophy." Many of these conditions of abiotrophy are associated with chronic inflammatory changes, and it is very difficult to say how far these cause the decay of the neurone or are the result of it; certainly a proliferation of neuroglia tissue may result from simple atrophy and decay of the neurones, but a perivascular lymphatic infiltration with lymphocytes and plasma cells are evidence of a reaction to the poison.

Now there are two diseases which I have studied for many years in which this perivascular cell infiltration, together with neuroglia proliferation, is particularly marked and more or less universal in the central nervous system. They are the diseases caused by two specific protozoal organisms—the *Trypanosoma gambiense*, the organism which causes sleeping sickness, and the *Spirochaeta pallida*, the organism of syphilis.

Sleeping Sickness.

When I first published an account of the histology of sleeping sickness, fourteen years ago, I pointed out the close similarity in the histological changes of the central nervous system to syphilitic meningo-encephalitis. I will show you now on the screen slides illustrating this, also one of experimental sleeping sickness. You will observe that the same perivascular infiltration with lymphocytes and plasma cells occurs in sleeping sickness, in syphilitic meningo-encephalitis, and in general paralysis of the insane (Figs. 6, 7, 8, 9, 10). In the last-named disease we have as Noguchi says, a parenchymatous meningo-encephalitis.

The knowledge of the cause of sleeping sickness began with the discovery by Castellani of the *Trypanosoma gambiense* in the cerebro-spinal fluid of five cases of sleeping sickness in Uganda, and the importance of this discovery is best shown by Sir David Bruce's acknowledgement in the fourth volume of the Sleeping Sickness Commission:

> This *most interesting discovery* of Dr. Castellani's, which was due to his introduction of the method of centrifuging the cerebro-spinal fluid in his search for streptococci, has been of the utmost value to the present Commission. It put them at once on the right track, and led to the easy and rapid elucidation of the hitherto mysterious disease. Without knowledge of his observation they might have worked for months in the dark, and, in truth, they might even have returned to England still ignorant as to the true cause of the disease.

Castellani had already given it as his opinion that a streptococcus was the cause of the disease, he believing that the trypanosome, like the *Filaria perstans*, was an accidental concomitant. If he had been able to extend his observations he might have changed his opinions. I mention this because a letter appeared in the *Times* disputing Professor Ehrlich's right to give any credit to Castellani for the discovery of the cause of the disease.

A large number of specimens of brains of cases of sleeping sickness were sent to me to examine by the Commission, and I could add little or nothing to my original description of the histological changes found in two cases of Manson which were in Charing Cross Hospital. I never succeeded in finding the trypanosomes in sections, but I have seen them in brain smears; the trypanosomes were always found in the cerebro-spinal fluid by Sir David Bruce.

Now the trypanosome of sleeping sickness is, comparatively to the *Spirochaeta pallida*, a large organism, and therefore it is not surprising that no one before Noguchi was able to find the specific organism of syphilis in the brains of general paralytics; although to my mind the facts which had already accumulated since Fournier pronounced this disease to be parasyphilitic seemed to be overwhelming proof that if there were no syphilis there would be no general paralysis.

CLINICAL AND ETIOLOGICAL FACTS SUPPORTING THE SYPHILITIC ORIGIN OF GENERAL PARALYSIS AND TABES DORSALIS.

(1) A history of syphilitic affection, usually of a mild form as regards secondary and tertiary symptoms, can be obtained in as large a proportion of cases of general paralysis as in obvious syphilitic skin lesions. (2) A correlation of the incidence of syphilis and the incidence of general paralysis in the two sexes according to the social grade. (3) In 60 cases of the juvenile form of general paralysis I found evidence of congenital syphilis either in the family history or signs on the body of the patient in nearly every instance, and in not one could it be excluded. In the juvenile form the sexes are equally affected. Mental stress, alcoholism, and sexual excesses, the previously attributed causes, can be excluded. (4) I showed

that Fournier was right in asserting that tabes and general paralysis pathogenetically were one and the same disease, affecting different parts of the nervous system, for I collected 70 cases of tabo-paralysis, and I found that some began as tabes and ended in general paralysis; in others the spinal and cerebral symptoms started simultaneously; while again in others it began with optic tabes and ended in spinal tabes or tabo-paralysis. About 10 per cent. of cases of tabes end in tabo-paralysis. (5) The most convincing proof of the syphilitic nature of general paralysis was Krafft-Ebing's inoculation of nine paralytics with no history and no signs on the body, none of whom were capable of reinfection. In all my very large experience I have never seen a primary sore or secondary eruption on a paralytic.

This chain of circumstantial evidence was strong enough for most neurologists, and eminent authorities such as Sir David Ferrier, Dr. Drummond, and many others were convinced, as I was, that if there were no syphilis there would be no tabes or general paralysis.

The Search for the Specific Organism in the Brain.

Then came the discovery of the *Spirochaeta pallida* of syphilis by Schaudinn, and the successful inoculation of anthropoid apes by Metchnikoff, Hoffmann, Neisser, and others, which was extended to other animals, such as apes and rabbits. This was followed by the introduction of the Wassermann reaction, and the blood of persons who were reacting to the syphilitic organism was shown to have complement fixation. It was soon found that general paralytics invariably gave the reaction in the most marked manner, and later Plaut showed that the cerebro-spinal fluid gave a positive reaction in 96 out of 97 cases, the serum giving it in every case. Indeed, the cerebro-spinal fluid was much more certain to give a positive reaction in general paralysis than in syphilis of the nervous system. My assistant, Dr. J. P. Candler, has found that 98 per cent. of paralytics give a certain positive reaction of the fluid, and the results have been already confirmed in over 200 cases by *post-mortem* examinations.

The introduction of the ultramicroscope led us to look for the spirochaete in the cerebro spinal fluid in a number of cases, but we did not meet with success. I also made a great number of preparations of sections of the brain by the Levaditi method, but, like Minea and Marinesco, who examined 30 cases of general paralysis, I was unsuccessful in finding the spirochaete. I therefore concluded that in all probability there was a latent granular form, and in the fourth volume of the *System of Syphilis*—"Syphilis of the Nervous System"—I put forward this view, supporting it by the fact that I had seen in smear preparations of condylomata enormous numbers of chromidian granules; likewise in sections of syphilitic papules, where only a few spirochaetes were seen, I have observed these granules. But my main argument was based upon the important observation by Leishman that the spirillum of tick fever exists in a granule form in the cells of the body of the tick, and he could cause these granules to develop into spirillary forms. Again, Neisser was able to infect monkeys with the marrow of bone of infected animals, although the most diligent search showed no spirochaetes. Noguchi himself thinks there may be a granule form; in fact, his culture experiments seem to indicate such. Moreover, Balfour and O'Farrell have stated that they have observed a shedding of granules after acting upon spirochaetes with salvarsan. The paper published in February by Noguchi and Moore, in which it was shown that Levaditi silver-stained preparations of 70 cases of general paralysis showed spirochaetes in 12 of them, was an epoch-making discovery.

When I was at the Rockefeller Institute in April Noguchi was good enough to give me one of these preparations, which left no doubt in my mind of their existence. Since this discovery by Noguchi we have a new conception of the disease on the sure ground of direct observation, yet there are still many facts unexplained; nevertheless, all the evidence points to the fact that the term "parasyphilis," meaning a post-syphilitic affection, must be superseded by the term *parenchymatous syphilis*. Noguchi has examined another 130 cases of general paralysis, and in this second series he found the spirochaetes in 36, making in all 48 out of 200. In 6 cases he examined fresh brains by means of the ultramicroscope, and in one of these he found spirochaetes. In 12 cases of tabes he found the organism in one only. Marinesco and Minea have reported that 1 case out of 26 yielded a positive result by the silver method. This case showed nests of spirochaetes, as many as 60 in one field of the oil-immersion being counted. I throw on the screen a photomicrograph of a specimen sent me by Professor Marinesco (Fig. 5).

Marie, Levaditi, and Bauchowski have reported 3 positive results out of 30 cases of general paralysis by the silver method. In a more recent publication they claim to have shown that spirochaetes are constantly present in the brains of general paralytics dying in seizures. They emphasize the importance of a systematic examination of all the convolutions of the cortex until a positive result is obtained. They do this by sections, by films prepared from an emulsion of the cortex and subsequent examination by the Indian ink method or the silver method of Fontana. They found spirochaetes in all the 7 cases examined. They observe that if one can localize the muscular epileptiform seizures a guide will be obtained of a focus of spirochaetes in the neighbourhood of the portion of motor area affected. I show a preparation kindly sent me by M. Marie (Fig. 4). Forster and Tomaszewski obtained 2 positive results out of 4 cases in which the material was taken from the patient by the Neisser-Pollak puncture method and examined by the ultramicroscope.

Noguchi's Experimental Observations.

Before referring to my own observations I will give a summary of Noguchi's experiments relating to the transmission of the *Spirochaeta pallida* obtained from the brains of general paralytics to the rabbit, and the experimental production of syphilitic encephalitis in this animal.

Noguchi inoculated the testicles of thirty-six rabbits with the emulsion of six different specimens of brains of general paralytics in the fresh state. At the end of ninety-seven days in one case and a hundred and two days in the other a small but typical induration of the testicle and scrotal skin occurred. In the first case the spirochaetes were few, in the second they were abundant. It is interesting to note how slow was the development as compared with the transmission by infection made with material obtained from a chancre or secondary lesion; in the latter case the lesions generally appear after an interval of four to six weeks, rarely two months elapse.

The Existence of the Parasites in the Parenchyma of the Nervous System in Relation to their Resistance to the Action of Drugs.

This interesting observation of Noguchi may be correlated with the many facts which seem to point to the specific organism that produces general paralysis being either a form which has been modified by the widespread use of mercury or modified by passing through the bodies of individuals who have acquired resistance. A number of instances of infection have been reported which seem to point to the possibility of a specific organism; the most convincing being that of Brosius, in which seven glass-blowers were infected, four of whom ten years later suffered with tabes or general paralysis. Certain it is that the average time after infection in general paralysis and tabes is ten years, and the signs and symptoms of the disease externally manifest in the form of skin and bone lesions are, as a rule, either absent, mild, or obscure; whereas in syphilitic brain and cord disease the great majority of the cases occur within the first four years after infection, the greatest percentage occurring in the first and second years. Whereas the signs and symptoms of the latter are coarse and obvious and with generally well-marked skin eruptions amenable to treatment, the former—the so-called parasyphilitic, or, as I shall prefer to call them, parenchymatous syphilitic disease—are late (quaternary) and comparatively unamenable to treatment. Is this because they are mercury-fast organisms, or is it because they exist in a latent granular or intracellular form in the parenchyma of the nervous system, where they cannot be attacked by the drugs such as arsenic, mercury, and antimony? By analogy this does not seem improbable, seeing that in sleeping sickness when once the trypanosome has invaded

the nervous system, atoxyl and other arsenical and antimonial preparations which are intravenously injected fail to kill the parasite and arrest the progress of the disease. Moreover there is other evidence in favour of this conclusion. Arsenic is not found in the brain when large quantities of arsenic have been taken in cases of poisoning; it has not been found in the fluid after injection of salvarsan intravenously. The late Professor Goldmann has shown that the choroid plexus intercepts dyes which have been injected intravenously in large quantities—namely, 100 c.cm. of a 1 per cent. solution of trypan blue—whereas 1 to 2 c.cm. of 0.5 per cent. solution injected by lumbar puncture stains the whole cerebro-spinal axis except the cortex, penetrating and staining all the neurones. This, as I shall tell you later, has led to the idea of a new method of treatment, not by injecting weak doses of salvarsan or neo-salvarsan intrathecally, for this would be a most dangerous proceeding; to kill the parasites you might kill the neurones and the patient.

The only case of trypanosomiasis Ugandensis that I have heard of as having recovered was a Sikh whose brain was sent to me for examination. He lived five years after infection and was treated for a long time—eighteen months—with atoxyl, then with mercury, for he became intolerant of arsenic and had contracted syphilis. Three years after infection his fluid was examined by Sir David Bruce and found free of trypanosomes, and he showed no signs or symptoms of sleeping sickness; he died two years later. I examined his brain and found no signs of perivascularitis or neuroglia proliferation—histological changes which were present in every case, 30 in all, that I had previously examined, and which during life had exhibited the characteristic lethargy.

These facts show that the presence of the trypanosome in the central nervous system is necessary to produce the meningo-encephalitis characteristic of the disease, although to my mind it is possible that toxins may pass into the central nervous system along perivascular and perineural lymphatics, as Orr and Rows have shown experimentally.

Further Experiments of Noguchi.

Noguchi has shown that the central nervous system of monkeys and rabbits is very resistant to syphilitic infection, even when the virus is introduced directly into the cerebral substance. Most animals remain in perfect health during an indefinite period after the intracerebral inoculation of *Spirochaeta pallida*. Noguchi conceived the idea that it was necessary to sensitize these animals by repeated intravenous injections with dead and living spirochaetes; this he did for five months. At the end of this time he made an intracerebral inoculation or subdural insertion of an emulsion of minute particles of testicular syphiloma of the rabbit, rich in spirochaetes. Twelve sensitized and 4 normal rabbits were employed, all of which remained healthy for two months; then some of the sensitized rabbits showed symptoms. The animals were killed and 3 of those which had been sensitized showed cerebral changes not unlike those of a syphilitic meningo-encephalitis. For my own part, I am doubtful whether these experiments prove very much one way or the other as regards the production of general paralysis in animals.

Personal Observations.

I will now refer to the recent work concerning the existence of the spirochaete in the brains of cases of general paralysis which has been done under my direction at Claybury; also I will endeavour to demonstrate the difference in the pathogenesis and histology of syphilitic meningo-encephalitis and general paralysis and syphilitic meningo-myelitis and tabes dorsalis. I will also compare the histology of sleeping sickness, a trypanosome infection, with the syphilitic spirochaete infections, and the deductions which can be made therefrom. Lastly, I will call your attention to an inquiry into the incidence of general paralysis in the different parishes and districts of the County of London.

Spirochaetes in the Brains of General Paralytics.

Having failed to find the specific organism in sections stained by the Levaditi method after a diligent search of numerous sections from numbers of cases—in this search I was aided by my assistant Mr. Charles Geary, Dr. Fisher, and Major Fink—I resolved to adopt the Indian-ink method (Burri); and by this method I soon obtained apparently positive results. I say apparently, for it must be admitted that delicate curled filaments may be mistaken for spirochaetes, and unless these spiral forms have been observed in the living state moving on the dark-ground microscope convincing proof of the presence of spirochaetes would be wanting. Yet I feel convinced they were, in the light of further researches by the Fontana method and the ultramicroscope.

I have thought that active pullulation of the specific organisms might be associated with epileptiform seizures, and in support of this I may observe that I have found that unilateral convulsions of a severe nature were at the necropsy associated with a great wasting of the corresponding hemisphere. For example, I have found after prolonged right-sided seizures a marked speech affection and a hemiparesis; at the *post-mortem* examination the left hemisphere has in some instances of this kind weighed as much as 100 grams less than the right. In the light of recent researches of Noguchi it is probable that the active development of the spirochaetes leads to the production of toxins which cause a rapid destruction of the neurones in two ways: Firstly, by the direct destructive effects of the toxins on the neurones; and secondly, by irritation and proliferation of the cell elements of the perivascular lymphatic sheaths, the capillary endothelium, and the neuroglia cells, the perivascularitis and capillary changes causing blood stasis and destructive effects on the neurones secondary to these inflammatory changes.

But to return to the demonstration of spirochaetal foci in the brains of paralytics. Having this hypothesis of association of active proliferation of the specific organism and the onset of seizures I wrote an encyclical letter to the superintendents of all the ten asylums asking them to forward me the brains of patients who just prior to death had had seizures, and from these brains, which numbered in all eleven, I obtained by the Indian-ink method spiral forms in 8 cases. Of 7 cases dying at Claybury in the ordinary routine and not selected, in 3 spiral forms were found (vide photomicrograph). Portions of all these eighteen brains were fixed and stained by Noguchi's modified silver method and sections made; so far specimens from eight brains have been examined, but without results; indeed, the fibrils in many of the specimens are stained, as well as in Levaditi preparations.

My assistant, Mr. Geary, has now succeeded in staining films with the Fontana-Tribondeau silver method, and we have obtained excellent results in 3 cases; in one of these—a brain sent from Horton, which was comparatively an early case—numbers of spirochaetes were found in film preparations (vide photomicrograph) of the second frontal convolution, but from no other of many regions examined. This shows the truth of Marie, Levaditi, and Bauchowski's observation that all the convolutions of the cortex require to be examined systematically. The spirochaetes of this case four days after death were also observed moving, it is true only sluggishly, by means of the ultramicroscope. Spirochaetes were not found in films from the second frontal when the brain was received; but twenty-four hours later, when the substance was soft and a certain amount of decomposition had occurred owing to invasion of other organisms, they were found in abundance in this one region.

Seeing that fetal tissues containing a great abundance of spirochaetes are generally decomposed and contain numbers of other organisms, as also chancres and the enlarged lymphatic glands, it is possible that the secondary microbial invasion by aërobic organisms may possibly favour in some way the development of the non-aërobic specific organisms, as we know is the case in tetanus. Certainly my experience teaches that pneumonia, dysentery, septicaemia, and other intercurrent secondary microbial infections are especially liable to be associated with seizures, not necessarily generalized, but often unilateral in character.

Further experiments and observations which I am now making will, I hope, help to decide whether the hypothesis of a latent granule form, which under favouring circumstances develops into a spirochaetal form with production of toxins, is true or not. The great difficulty is that the search for spirochaetes in the brain is like looking for the proverbial needle in a haystack; not finding does not

mean non-existence. The investigation is attended with great technical difficulties, and there is still much to be done before we can fully understand the pathogenesis and pathology of these late syphilitic diseases of the nervous system.

INTRATHECAL INJECTION OF PATIENTS' SERUM AFTER SALVARSAN TREATMENT.

In respect to the early acute infection of the central nervous system, I may mention that I recently had under my care a case of gummatous meningo-encephalitis. Infection occurred in February last, and, in spite of intramuscular injections of salvarsan and mercury, severe cerebro-spinal symptoms set in in September. The cerebro-spinal fluid showed a great abundance of lymphocytes, and a spiral form which resembled a short spirochaete was found in one of the Indian-ink preparations of the centrifuged deposit. As I could not find spirochaetes moving with the dark-ground illumination this is not claimed as convincing proof. The cerebro-spinal fluid, like the blood, in this case yielded a very marked complement fixation. He subsequently received an intravenous injection of 0.4 gram neo-salvarsan with great improvement, but the greatest improvement resulted from an intrathecal injection of serum taken one hour after another dose of neo-salvarsan had been administered; subsequent to this the fluid became less positive, and the lymphocytosis disappeared.

The serum was tested for arsenic and yielded no result; the legitimate conclusion being that the action of the serum is due to the presence of antibodies in the blood and not to the arsenic. But seeing that I have found that intravenous injections and even intramuscular injections of salvarsan may convert a positive Wassermann reaction of the fluid in general paralysis into a negative reaction, and thus account for the improvement, it is necessary that the serum of another individual who had received an intravenous injection of salvarsan should be injected into the lumbar subarachnoid sac before it could be claimed that the antibodies in the serum were the cause of the improvement. Dr. Swift, of the Rockefeller Institute, who claims to have obtained very hopeful results by this method of treatment in tabes dorsalis, said at the International Medical Congress that he had done this with equally satisfactory results. If this be true it would appear that mercury and arsenic are spirillocidal either by causing the development of antibodies or by furthering their spirillocidal action. Dr. George Robertson, of Morningside Asylum, from his experience, does not claim to have attained a cure, and is quite judicial in his statement regarding the effect of this treatment in general paralysis, for he says:

> Although success has not been obtained there are hopeful indications, for it appears that the disease process, if not suppressed, is at least touched in half the cases. The decrease in the lymphocytosis, the diminution in the intensity of the Wassermann reaction, and its disappearance for over a year in some cases are hopeful signs of the most convincing character.

Dr. Fisher, of the Rockwood Hospital, Kingston, Canada, who for some months past has been working under my direction at the Pathological Laboratory, Claybury, had the idea of treating general paralysis by this method, and in the spring of 1912, by the kindness of the superintendent, Dr. Ryan, Dr. Fisher took 7 cases of advanced general paralysis and rendered the blood negative to the Wassermann reaction by repeated intravenous injections of salvarsan. Then, under rigid antiseptic precautions, he withdrew 15 to 20 c.cm. of blood from the median basilic vein of the patient's arm, placed this in a cool chamber for one hour, separated the clot, and centrifuged the serum for half an hour in sterile tubes. Next he performed lumbar puncture, and withdrew cerebro-spinal fluid of an amount equal to that of the serum to be injected, which is slowly introduced, being kept at the body temperature. The patient is allowed for one hour to lie flat on his back without a pillow, and with the foot of the bed raised. This treatment was repeated every week for the first three months, then every two weeks for the next four months. No untoward symptoms occurred in any of the cases under treatment, and he has learnt that the cases have greatly improved, and apparently there has been an arrest of the symptoms so far.

In the Oliver-Sharpey lectures which I delivered at the Royal College of Physicians of London in April, 1910, I gave many reasons from experiment and observation why it seemed probable that the cerebro-spinal fluid functions as the lymph of the brain. I also pointed out that, inasmuch as normally it contains no proteins or cell elements, if microbial invasion occurred it tended to spread rapidly because the fluid normally contained no bactericidal action nor leucocytes capable of combating microbes. These experiments of introducing serum of patients, which presumably contains antibodies, rest therefore upon a scientific basis if my conclusions are correct. At the same time it is difficult for the serum to arrive at the crannies in the cortex by injecting it by lumbar puncture into the subarachnoid space, for Goldmann's researches with trypan blue show that the cortex is unstained when the dye is introduced by lumbar puncture. He found, however, that the cortex is well stained when the dye is introduced by trephining the calvaria. It is possible that by repeated injections, as in Dr. Fisher's experiments, the antibodies may reach the cortex by lumbar puncture. Goldmann's work, however, shows the desirability of trying the method of introducing the serum directly into the subdural or subarachnoid space of the cortex. Unfortunately, I have not the authority to try this in my capacity of pathologist to the London County Asylums.

DESCRIPTION OF SPECIAL PLATE.

Fig. 1.—Spirochaete in smear of condyloma stained by Giemsa (× 1,800).

Fig. 2.—Spirochaetes from a smear of brain in a case of general paralysis; stained by Fontana silver method (× 1,400).

Fig. 3.—Smear of brain of general paralytic, stained by Indian ink method showing spirochaete (× 1,550).

Fig. 4.—Section of brain stained by a silver method from a preparation by Professor A. Marie (× 1,740). Many spirochaetes are seen in the field, but only one in focus.

Fig. 5.—Section of brain of general paralysis stained by the silver method, showing spirochaetes, one in focus: preparation of Professor Marinesco (× 1,550).

Fig. 6.—Section of the brain of general paralysis, showing small vessel with perivascular cell infiltration (× 350).

Fig. 7.—Small vessel of the brain in cerebral syphilis, showing perivascular cell infiltration (× 250).

Fig. 8.—Section of the brain from experimental sleeping sickness, showing small vessel with perivascular cell infiltration (× 250).

Fig. 9.—Section of the brain from human sleeping sickness, showing small vessel with perivascular cell infiltration (× 350).

Fig. 10.—Section of brain in general paralysis, showing longitudinal section of vessel with active proliferation of plasma cells (× 750).

Preparations 6, 7, 8, and 9 stained by polychrome blue.

THE WASSERMANN REACTION.

I have already mentioned that in practically every case of general paralysis a positive Wassermann reaction is obtainable in the cerebro-spinal fluid, whereas not more than 50 per cent. of the cases of tabes yield a positive reaction. Why is this? In my opinion the reaction in the cerebro-spinal fluid is evidence of the existence of the parasites or their toxins in the central nervous system. I consider that it is the toxins produced by the active generation of the parasites which cause the reaction, the degeneration of the neurones, and the active proliferation of the lymphocytes, plasma cells, and neuroglia cells. For several reasons I consider it is a reaction of the neurones which gives rise to the euglobulin in the fluid that serves as a complement fixative. First, because the toxins of other specific organisms—for example, tubercle—give rise to lymphocyte, plasma cell, and neuroglia proliferation without producing complement fixative in the fluid. Secondly, because some cases—in fact, the majority of cases of cerebro-spinal syphilis, even cases with active meningitis and enormous numbers of lymphocytes in the fluid—nevertheless give a negative Wassermann reaction, and there is no complete parallelism between lymphocytosis and degree of complement fixation. The experiments of Levaditi and Yamanouchi, however, show

FIG. 1.

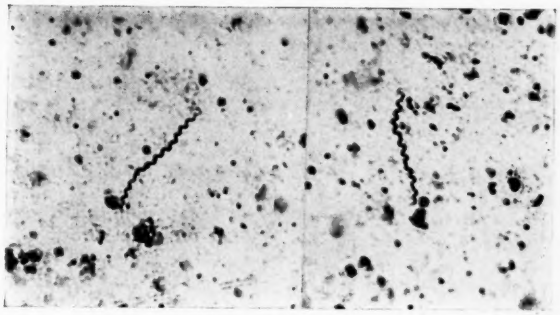

FIG. 2.

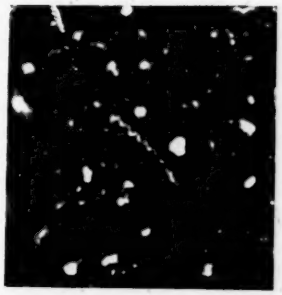

FIG. 3.

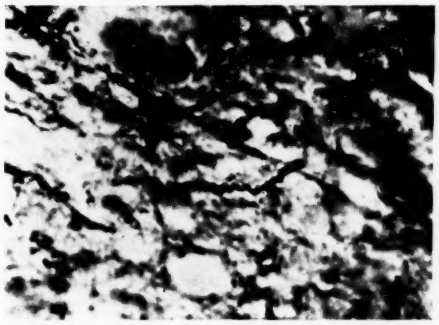

FIG. 4.

FIG. 5.

FIG. 6.

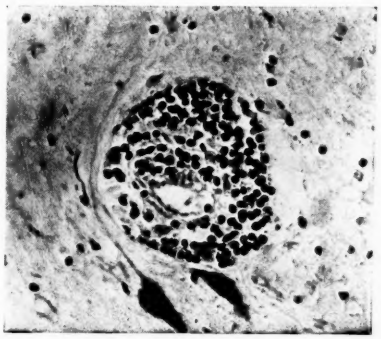

FIG. 7.

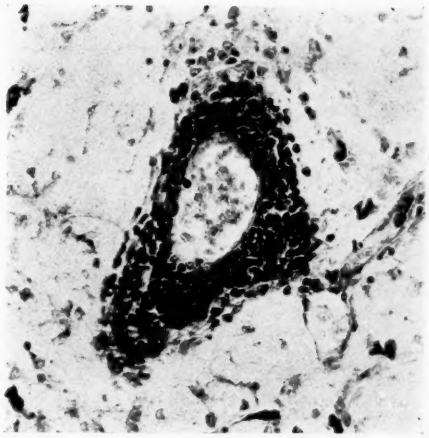

FIG. 8.

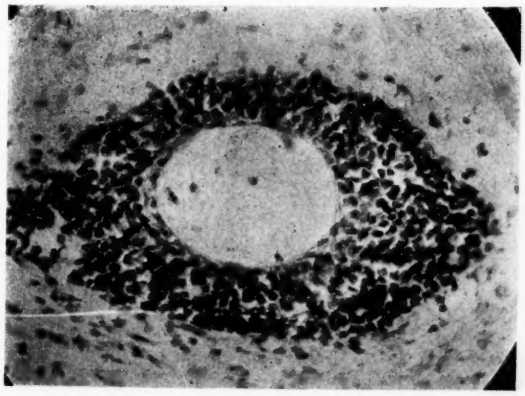

FIG. 9.

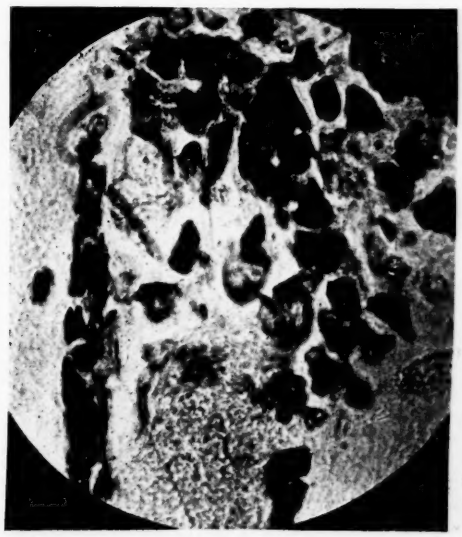

FIG 10

that it is the toxin of the spirochaetes, and not the parasites themselves, which induces the typical lymphocyte and plasma cell reaction. Thus they introduced a small portion of infected cornea of a rabbit containing abundant spirochaetes into the anterior chamber of the eye of a healthy rabbit, and they observed a characteristic cell reaction in the cornea of the normal rabbit before there was an invasion by spirochaetes. This experiment shows that a localized nest of spirochaetes in the cerebro-spinal axis or even outside the central nervous system, provided the toxins can be conveyed by lymphatics, can set up the characteristic cell reaction in the perivascular spaces of the nervous system, each fresh dose of toxin leading to a remission of symptoms and decay of nervous structures.

We know that normally the choroid plexus does not let this toxin pass into the cerebro-spinal fluid any more than it does the antibodies, for the blood may give a very strong reaction in cases of syphilis, and yet the cerebro-spinal fluid not show the slightest trace of reaction. Now the cerebro-spinal fluid in great part is secreted by the choroid plexus into the lateral ventricles; consequently fluid withdrawn from the lateral ventricles should give a less marked reaction than that withdrawn by lumbar puncture, for the latter would have been in contact longer with the nervous tissue. Acting upon this hypothesis, I asked my assistants, Dr. Candler and Mr. Mann, to examine a number of cases to test its validity. In 38 cases the fluid was withdrawn as soon after death as possible from the lateral ventricles and by lumbar puncture; the result obtained in all the instances was to show that the fluid obtained by lumbar puncture was from two to ten times as strong in linking up complement as that from the ventricles. Doubtless if the fluid could be obtained as it was secreted during life into the lateral ventricles no specific globulin would exist in it.

Tabes being a much slower decay of the neurones, and limited to the posterior spinal afferent neurones in the great majority of cases, presumably is occasioned by small doses of toxin finding entrance to the posterior columns by limited and defined channels; indeed, it is conceivable that the syphilitic toxin may arise in lesions of the thoracic or abdominal aorta which, passing along the lymphatics of vessels, gain access to the lymphatics of the spinal cord, the circulation of the lymph being along the course of the afferent roots. This seems probable from the experiments of Orr and Rows, who have, by tying celloidin capsules containing microbial toxins on the sciatic nerve, produced a perivascularitis in the posterior columns with degeneration of exogenous afferent systems like those of tabes. Possibly the perivascular lymphatics of the carotids may convey toxins or even the specific organisms to the fronto-central region of the brain in cases of general paralysis. This is a not improbable source of infection, for if skin lesions of syphilis are rare in this disease, syphilitic nodular fibrosis of the aorta is extremely common.

Comparison of the Lesions of Syphilitic Disease of the Brain and Cord in Early Stages after Infection with those Occurring Late, on an Average Ten Years after Infection.

In both there is the same perivascular infiltration with lymphocytes and plasma cells; this is the reaction to the toxin produced by the parasite. In syphilitic brain disease there is also an endarteritis, sometimes localized, sometimes universal, and it is the blocking of the vessels by this inflammatory condition, especially when associated with thrombotic occlusion, which occasions the symptoms of so varied and obtrusive a character and sudden in onset. So also in focal meningo-myelitis the localized decay of neuronic structure giving rise to paraplegia is due to obliterative endarteritis more than to the meningeal and perivascular inflammatory changes. If the vessels are not damaged extensively remarkable curative results by specific treatment are obtainable. The Argyll Robertson pupil so characteristic of tabes and general paralysis is not seen.

In general paralysis examination of the vessels of the brain seldom shows any evidence of endarteritis; if there is any extensive vascular inflammation it is in the capillaries, where undoubtedly the endothelium undergoes active proliferation and budding; the reason for this cannot be the toxin circulating in the blood, otherwise the endothelium of the arteries and veins would show it. Probably the specific toxin is in all the interstices of the nervous tissue wherever the cerebro-spinal fluid irrigates; thus it comes in contact with the capillary endothelium and excites its active proliferation, with capillary blood stasis, a histological condition that is especially characteristic of general paralysis.

I have met with a few cases of syphilitic brain disease which have terminated in typical general paralysis, and Straussler has reported several. A striking feature of general paralysis and the most consistent naked-eye phenomenon, which is not seen to anything like the same degree in syphilitic brain disease nor in sleeping sickness, is the granular condition of the ventricles, especially the fourth ventricle. This indicates the prolonged existence of an irritant toxin in the cerebro-spinal fluid. The greater the wasting of the brain the more pronounced is this change. The wasting of the fronto-central convolutions and of the whole cerebral cortex, but to a less degree, is a characteristic feature of this disease (general paralysis) as compared with syphilitic brain disease. Doubtless this is in part due to the vascular changes, but inasmuch as in sleeping sickness the perivascularitis and meningitis may be as extensive as, and even more universal and extensive than, in general paralysis, it must be concluded that there is also in this disease a primary and progressive decay of the neurones, owing to the continuous action of the toxin sensitizing the nerve cells and causing them to react to such a degree that the normal metabolic equilibrium is destroyed and degeneration ensues, so that we have, as Noguchi asserts, a parenchymatous encephalitis.

The Incidence of General Paralysis in the Population of London.

If it could be assumed that 2 to 3 per cent. of persons who acquired syphilis developed general paralysis it might help us to estimate approximately the extent of syphilis in a population; for inasmuch as general paralysis is a disease fatal within a few years of admission to the asylum, accumulation of cases suffering from this disease does not occur, consequently the death-rate per annum is about equal to the admission-rate. I will throw on the screen a lantern slide showing the incidence of general paralysis in the general admissions to the London County Asylums during the years 1911–12 from the parishes north and south of the Thames, east and west; I will point out the main results which these tabulated statistics show.

North of the Thames—West-end parishes. Total population equals 1,376,083. Male admissions 1,183; of these 205 were general paralytics, so that the percentage of paralytic male admissions is 17.3. Female admissions 1,236; of these 31 were general paralytics, so that the percentage of paralytic females is 2.5. So that general paralysis is seven times as frequent in males as compared with females in West-end parishes north of the Thames.

North of the Thames—East-end parishes. Total population equals 1,282,911. Male admissions 930; of these 123 were paralytics, so that the percentage of paralytic male admissions is 13.2, against 17.3 in the West-end parishes north of the Thames. Female admissions 981; of these 34 were general paralytics, so that the percentage is 3.4 in eastern parishes north of the Thames, against 2.5 per cent. in the West-end.

In West-end parishes north of the Thames we will find that 1.75 per 1,000 residents were admitted in the two years, and of these 9.7 per cent. were general paralytics. In East-end parishes north of the Thames 1.49 per 1,000 were admitted in the two years, and of these 8.2 per cent. were general paralytics.

In West-end parishes south of the Thames the results obtained are somewhat different, for both males and females have a higher percentage of general paralytics in the western parishes; however, this quite accords with the character of the population in Wandsworth and Lambeth.

In the western parishes the total population is 777,321. The male admissions are 537; of these, 97 are paralytics, a percentage of 18.3. The female admissions are 641; of these, 20 are general paralytics, percentage 3.1. Both male and female incidence of paralysis are high.

In the eastern parishes the total population is 1,066,989. The male admissions are 741; of these, 102 are paralytics, a percentage of 13.7. The female admissions are 825; of these, 23 are paralytics, a percentage of 2.7.

The western parishes are higher in both male and female paralytics; in the former 10 per cent. of the total admissions are paralytics, to 7.9 per cent. in the latter.

These facts entirely agree with what we know of the incidence of general paralysis in the two sexes from practice—namely, the lower we go in the social scale,

the more common becomes this disease in the female sex; whereas general paralysis is common to all grades of society in the male sex, it is very rare in the better and respectable classes of females in all grades of society. Probably these statistics give a rough idea of the relative prevalence of syphilis in the two sexes.

We may conclude, therefore, that syphilis is comparatively commoner in the West End among males and comparatively in the poor East End among females. Seeing that a very considerable number of paralytics in the West End do not come into the county asylums, it may be assumed that the ratio of six males to one female is well under the mark.

BIBLIOGRAPHY.

[1] Bruce, Sir David: Sleeping Sickness Commission, vol. iv.
[2] Candler, J. P.: Results of Wassermann Reaction: Discussion on Syphilis, *Proc. Roy. Soc. Med.*, vol. v, Supplement, 1912.
[3] Ehrlich: The Harben Lectures on Experimental Researches on Specific Therapeutics, Lecture I, *Lancet*, June 15th, 1907, p. 1634, and Lecture III, *Lancet*, August 10th, 1907, p. 351.
[4] Forster and Tomaszewski: *Deut. med. Woch.*, 1913, Band xxxix, p. 1237.
[5] Fournier: *Les Affections Parasyphilitiques*, 1894.
[6] Goldmann, E.: *Vital Farbung am Zentralnervensystem*. Verlag der Königl. Akademie der Wissenschaften. Berlin, 1913.
[7] Levaditi et Yamanouchi: L'Orientation de la Syphilis, *Comptes Rendus de la Société de Biologie*, vol. lxiv, 1908. Ibid., *Annales de l'Institut Pasteur*, vol. xxii, No. 10, October, 1908.
[8] Marie, Levaditi, et Bauchowski: Présence Constante du Tréponème dans le Cerveau des Paralytiques Généraux Morts en Ictus, *Comptes Rendus de la Société de Biologie*, vol. lxxiv, No. 17, 1913.
[9] Marinesco et Minea: Absence de *Spirochaeta pallida* dans le Système Nerveux Central des Paralytiques, Société de Neurologie, April 5th, 1906. Ibid., Présence du *Treponema pallidum* dans la Paralysie Générale, *Comptes Rendus Hebdomadaires*, vol. lxxiv, No. 16, 1913. Ibid., Association de Méningite Syphilitique et de Paralysie Générale, Présence de Tréponèmes dans les Méninges, Réunion Biologique de Bucarest, March 6th, 1913.
[10] Mott, F. W.: *Proc. Roy. Soc. Med.*, Special Syphilis Number, 1912. Ibid., *System of Syphilis*, vol. iv, Diseases of the Nervous System. Ibid., Histological Observations on the Changes in the Nervous System in Trypanosome Infections, especially Sleeping Sickness and Dourine, and their Relations to Syphilitic Lesions of the Nervous System, *Archives of Neurology*, vol. iii. Ibid., Tabes in Hospital and Asylum Practice, *Archives of Neurology*, vol. ii. Ibid., The Changes in the Central Nervous System of Two Cases of Negro Lethargy, BRITISH MEDICAL JOURNAL, 1899, p. 1666.
[11] Neisser, Albert: *Beiträge zur Pathologie und Therapie der Syphilis.*
[12] Noguchi: Studien uber den Nachweis der *Spirochaeta pallida* im Zentralnervensystem bei der progressiven Paralyse und bei Tabes dorsalis, *Muench. med. Woch.*, April 8th, 1913. Ibid., *La Presse Méd.*, No. 81, 1913.
[13] Noguchi and Moore: A Demonstration of *Spirochaeta pallida* in the Brain in Cases of General Paralysis, *Journ. Exper. Med.*, February, 1913.
[14] O'Farrell and Balfour: Granule-shedding in *Treponema pallidum* and Associated Spirochaete, *Journal of the Royal Army Medical Corps*, vol. xvii, No. 3, September, 1911.
[15] Robertson, Geo.: General Paralysis of the Insane, Morrison Lectures, *Journal of Mental Science*, April, 1913.
[16] Swift: *Studies from the Rockefeller Institute*, vol. xvii, 1913.

THE RELATION OF THE INTERNAL SECRETIONS TO THE FEMALE CHARACTERISTICS AND FUNCTIONS IN HEALTH AND DISEASE.

A PAPER INTRODUCTORY TO A DISCUSSION ON THE SUBJECT AT THE OBSTETRICAL AND GYNAECOLOGICAL SECTION OF THE ROYAL SOCIETY OF MEDICINE.

BY W. BLAIR BELL, M.D.,

GYNAECOLOGICAL SURGEON TO OUT-PATIENTS, ROYAL INFIRMARY, LIVERPOOL; EXAMINER IN GYNAECOLOGY AND OBSTETRICS, ROYAL COLLEGE OF SURGEONS, ENGLAND, AND TO DURHAM UNIVERSITY.

[*Abstract.**]

IN dealing with the problems under discussion it will be best, I think, first to outline the more purely morphological and physiological aspects. I shall do this briefly, for I have already this year, in the Arris and Gale Lectures,[4]† gone somewhat fully into the details of this part of the subject. Afterwards I shall indicate what I believe to be the associated pathological conditions to be recognized, and in some cases the methods whereby they may be treated.

PART I.

MORPHOLOGICAL AND PHYSIOLOGICAL CONSIDERATIONS.

At the commencement it is essential that we consider how far the internal secretions are concerned in producing the feminine characteristics and ensuring the full development of the genital organs. Afterwards I shall support with experimental evidence my statement that the internal secretions of the ovary alone are not the sole factors in the preservation of the integrity of the genital functions once these have been fully established.

PRODUCTION OF THE FEMALE CHARACTERISTICS AND FUNCTIONS.

What is it that makes a woman a woman? With our present knowledge it appears probable that, although the potentiality to produce femininity exists in the earliest stages of segmentation of the ovum, this potentiality is directed towards the future development and correlations of the endocrinous glands which are to control the sexual evolution of the individual.‡

It may be stated most emphatically that the ovaries alone are not responsible for the female characteristics. This is not mere conjecture, for it was first well shown by Bulloch and Sequeira[10] that the suprarenal cortex is largely responsible for the secondary sexual characteristics. Most of the evidence, however, in regard to the influence of the suprarenals has been obtained from pathological phenomena which will be discussed later.

We know less of the actual influence over the secondary characteristics of the other organs of internal secretion, but there is a large body of evidence gradually accumulating which tends to show that the pure female and the pure male are produced by all the internal secretions, probably acting in association with that of the gonads.

We must next consider the influence the endocrinous glands exert on the secondary development of the female genital organs and their functions in the individual perfectly formed in regard to the genitalia and secondary characteristics. This part of the subject is one which in its pathological aspect constantly confronts us in our clinical work.

Although the genitalia may be normal morphologically at birth (primary development), they only become functionally active at puberty (secondary development) if the whole endocrinous system is in perfect harmony and acting efficiently. Thus, thyroid or pituitary insufficiency may cause the genital organs to remain infantile; and, as we shall see later, disease of these structures may cause retrogression in the genitalia even after they have functionated normally. Further, it is known that the gonads and uterus remain under-developed until the thymus atrophies at the time of puberty. At this period of life, owing to the withdrawal of the thymus secretion, as some au horities think, the genital organs begin to develop. Other investigators, however, believe that it is the development of the gonads which causes retrogression in the thymus. The probability is that both views are correct; for experimentally it is found that removal of the ovaries leads to hypertrophy of the thymus, even after atrophy has occurred in the normal course of events. Likewise removal of the thymus in male guinea-pigs is said to be followed by a rapid development of the genital glands (Paton).[17]

MAINTENANCE OF THE FEMALE CHARACTERISTICS AND FUNCTIONS.

It follows logically that the factors which give rise to femininity and the normal development of genital activity should also be chiefly concerned in the maintenance of the female characteristics and functions. I shall adduce further evidence to show that this is so when we consider the pathological aspect of the subject under discussion. Here the normal processes at work may be described.

That the ovary alone is not solely responsible for the changes which occur or for the integrity of the genitalia is shown by many facts, both experimental and clinical. It is well known, however, that the removal of the ovaries in young animals tends to produce sometimes adiposity and almost invariably overgrowth of the skeleton; the animal is never stunted, nor do masculine characteristics develop. The uterus, however, remains infantile and does not undergo secondary development. So, also, it is certain that if the female genital glands be removed during adult

* The paper will be published in full in the *Proceedings* of the Royal Society of Medicine.

† These lectures may be read in conjunction with this paper, which is in part an attempt to apply the experimental findings to clinical practice.

‡ The word "developmental" may be used in connexion with two periods or stages in the development of the genital organs. The first stage is during fetal life, when the organs are originally formed; and the second is at puberty, when full anatomical and physiological development takes place.

life the uterus retrogresses and becomes atrophied. Some years ago Hick and I [5] showed that the primary change is in the musculature, and not in the endometrium. This change is the obvious evidence of the ovarian function in regard to the uterus. Atrophy of the uterus can, however, be prevented for a time if an ovarian graft—especially an autogenous one—be made when oöphorectomy is performed. It is found experimentally that the follicles in grafts always degenerate, but that the interstitial cells remain unchanged for many months. The success of grants depends on the technique employed. Thin grafts buried in a vascular site do much better than thick grafts in avascular areas. When finally the graft disappears the uterus atrophies. It is obvious, therefore, that the integrity of the uterus depends, so far as the ovary is concerned, on the interstitial cells. But Crowe, Cushing and Homans, [8] Aschner, [2] Biedl [6] and others have shown that the same degree of uterine atrophy—and also, it is said, ovarian atrophy—may supervene after partial removal of the pituitary body. Which portion of the pituitary is supposed to be concerned is not clear from the contradictory statements given. It is possible that the divergent opinions result from the belief that the pituitary body consists of two separate organs with different functions. I believe, however, that the pituitary body is *one organ*. In spite of the histological differences seen in the various parts we must remember that all the epithelial elements are derived from the same source—Rathke's pouch.

Further, I have shown that removal of the thyroid alone produces an intense degree of atrophy in the uterus. The ovaries, however, do not retrogress; on the contrary, there appears to be increased activity, especially in the follicles.[4] In pregnancy, also, we know that the ovaries, the thyroid, the pituitary, and the suprarenals are all concerned in the changes that take place locally and generally. The corpus luteum in the ovary appears to assist in the implantation of the ovum, especially in rodents. This effect apparently is less pronounced in the human subject. The thyroid is especially active in early pregnancy, and the suprarenals and pituitary in the later stages. The changes in the pituitary are shown by very remarkable modifications in the staining reactions of the cells of the anterior lobe. These structural alterations are doubtless essential to the changes in the maternal metabolism, but it is unnecessary here to discuss the chemical details.

In addition to the facts mentioned concerning the local effects of the removal of the ovaries, pituitary, and thyroid on the genital organs and their functions, we have very definite and precise information as to the general effects produced. And since the removal of the ovaries is an experiment some gynaecologists perform on the human subject with regularity and without a qualm—indeed they defend it by saying when they perform oöphorectomy the bad results are not worth considering—I am sure we should give this aspect of the subject special consideration, since we are not all of the same mind as to the needless removal of the genital glands.

In the first place, I would call attention to the well-known fact that women as well as animals vary very considerably in the reactions that occur after oöphorectomy. Age, individual variations in ovarian activity and in the correlations with other endocrinous glands, habits of life, health, and so on, all play an important part in the result.

We might also include psychical effects, because they are related to the functions of the internal secretory system as a whole; but these effects are difficult to estimate in animals, so I shall not discuss them until we come to the consideration of the pathological disorders of the internal secretions in women. Since, then, there are these individual variations, it is somewhat difficult to create a quantitative standard, and this is, I think, the reason of so many divergent opinions in regard to the value of the ovaries. We can, however, recognize the qualitative changes with no small degree of precision.

In animals oöphorectomy produces the following alterations in the general metabolism:* There is a marked retention of calcium, which is, of course, a phenomenon normally associated with senility. The phosphorus excretion is much increased, as is the nitrogen. These observations I shall refer to again in discussing ovarian insufficiency in the human subject.

When we come to examine the other endocrinous glands after oöphorectomy in animals we find somewhat different changes according to the order to which the animal employed for experimentation belongs. I have elsewhere alluded to the normal morphological differences found in the organs of internal secretion in different animals.[4] The cat is the most convenient of the commoner animals used in laboratories, in that its endocrinous glands more nearly resemble the human than do those of the rabbit and other rodents. In this animal we find marked changes in the anterior portion of the pituitary and in the thyroid after oöphorectomy. In the thyroid there is a great increase in the colloid collections. In the anterior lobe of the pituitary there is a marked eosinophilia which I have discussed elsewhere, and have described as representing an increase in secretory activity.[4]

We must not consider, however, that our experimental results are final in regard to the human subject until they have been verified by *post-mortem* evidence in women, or by the evidence of disease. Rapid progress to this end would be assured if pathologists would make a routine practice of removing all the organs of internal secretion during *post-mortem* examinations, and of examining histologically the material obtained. Meanwhile laboratory experiments have this effect at least: they give us indications for clinical observation which so often leads to a complete vindication of the laboratory results, and so to settled knowledge.

PART II.

Pathological and Therapeutical Considerations.

In considering the relation of pathological conditions of the internal secretions to the genital organs and their functions I shall follow as far as possible the arrangement adopted in describing the physiological processes—that is to say, I shall first discuss the derangements in the normal development of the genital organs and their functions, and subsequently the derangements associated with the maintenance of these functions.

Derangements in the Development of the Genital Organs and their Functions.

1. *Imperfect and Irregular Primary Development of the Genitalia.*

Primary maldevelopment of the genital organs may result in the following conditions:

(*a*) Under-development of the ovaries and uterus, which may otherwise be perfectly formed.

(*b*) Under-development or imperfect development of the uterus with normal development of the ovaries.

The first of these conditions is usually associated with what is known as asexual ateleiosis, the cause of which is due, no doubt, to some general disorder in the endocrinous system. At the present time we have no definite knowledge on this matter, but it is hardly possible that genital under-development with ateleiosis can be due to primary ovarian insufficiency alone in view of our experimental evidence.

The second class of case, in which the ovaries are normal while the rest of the genitalia are imperfectly developed or even assume male characteristics, is interesting if only because some of the conditions met with are liable to be confused with those in the first class.

It is probable, however, that in the presence of normal ovaries imperfect development of the uterus and incomplete union of the Müllerian ducts, with the various associated abnormalities which may be found, are due to some local structural irregularities which are, as yet, not fully understood.[3] But where the genitalia, apart from the ovaries, assume the male type, and, in fact, give rise to the condition known as hermaphroditismus femininus, we have some definite evidence of the influence of an internal secretion not produced by the genital glands on this condition.

2. *Irregular Secondary Development of the Female Genitalia and Characteristics.*

By secondary development of the genital organs and female characteristics I refer to the changes which

* In his recent work on the organs of internal secretion, under the title of *The Regulators of Metabolism*, Paton calls attention to the fact that only observations conducted over a length of time can have any value, and assumes that none have been made. But, as is evident in various parts of his book, he has not made a first-hand study of the literature, for my experiments, of which he makes no mention, were conducted over far longer periods than he suggests as being necessary.

normally occur at puberty. The onset of the functional activity of the ovaries and the associated secondary sexual characteristics which become evident at this time change the girl into a woman.* Since the advent of puberty itself is dependent on the general metabolism, which is influenced by the internal secretions, we can easily understand how disorders of the endocrinous system influence the phenomena associated with this period of life.

(*a*) *Precocious Puberty.*—This is an extremely interesting phenomenon, wholly dependent, as far as we know, on disturbances in one or other of the endocrinous glands. It is probable, of course, that a lesion in one organ affects the others, but with this we are not at the moment concerned. In the first place, it is important to remember that the results produced by tumours and hyperplasias in the organs of internal secretion other than the gonads are not the same in the different sexes. So that while suprarenal hypernephromata in *male* children are practically always associated with precocity of the sexual organs and secondary characteristics, in female children with suprarenal hypernephromata the sexual organs are not precociously developed, for the tendency is rather to produce in them the characteristics of the male—a deep voice, enlargement of the clitoris, hirsuties, and so on. It is true that cases of precocity in females with these suprarenal lesions have been described, but it appears to me that pubic hirsuties with over-development of the clitoris—a masculine transformation—may have been wrongly interpreted into excessive development of the female external genitalia, as was certainly done in Orth's case.[16] Bulloch and Sequeira,[7] however, report the case of a girl, aged 11, whom they describe as precocious, and in whom menstruation existed. But I do not think the evidence submitted is sufficient to justify the statement as to *female* precocity, especially in view of the facts that she only commenced to menstruate at the age of 10, and that subsequently she had much hair on the lips and chin.

It is probable, therefore, that the view I have stated is the correct one; indeed, I fail to understand how it can be otherwise when we consider the evidence at our disposal as to the masculine metamorphosis that occurs with these same lesions in the suprarenals in young adult women. Most of the cases of suprarenal hypernephromata observed in children have occurred in girls. In the case of a boy, who died at the age of 5, recorded by Linser,[13] there was precocious development of the genital organs with sexual activity. Likewise it is interesting to note that tumours of the pineal in boys always lead to sexual precocity, but do not do so in girls.

It is difficult to interpret this curious sex selection in regard to these lesions in different organs, but certainly it appears at first sight as if both the pineal and suprarenal cortex influenced the production of male characteristics. We must remember, however, that we have no reliable evidence as to whether tumours of the pineal give rise to excessive or decreased secretion, but the above suggestion does not necessarily depend on an increased secretion from the pineal in the circumstances mentioned.

Although the foregoing facts concerning the suprarenal cortex and the pineal are negative in regard to sexual precocity in girls, I have dwelt on them as it is necessary to clear the ground in this matter, for most clinicians seem to be under a misapprehension, since they conclude that corresponding lesions produce sexual precocity in either sex. This, as I have endeavoured to show, is not so except in regard to lesions in the gonads. Indeed, to come to the point, it appears probable that nothing in regard to lesions in the endocrinous glands except certain tumours and hyperplasia in the ovaries will give rise to true sexual precocity in the female. Many such cases are on record. A typical example is that related by Lucas:[14] A girl, aged 7, had markedly precocious development with menstruation. A solid ovarian tumour of doubtful nature was removed, and the signs of puberty thereupon gradually disappeared. It follows, therefore, that unlike sexual precocity in boys, this phenomenon in girls is *only* associated with tumours or hyperplasia of the gonads.

(*b*) *Delayed Puberty.*—Delayed puberty may be due to a variety of causes, such as bad feeding, unsuitable occupation, chlorosis, and so on, in which it is difficult to trace a primary cause in the internal secretions; at any rate, one need take no account of them in the treatment of such cases. But there is a large number of instances in which the organs of internal secretion are primarily at fault. As already stated, the internal secretions of the ovary mainly produce their effects in correlation with other internal secretions; and the full development of the genitalia, therefore, is dependent on the general metabolic conditions prevailing under the influence of all the endocrinous glands. So that, strictly speaking, one cannot consider under-development of the ovary as a primary factor in delayed puberty, although, undoubtedly, it may be found to be under-developed as a correlated condition. Practically, it appears that the thyroid and pituitary, in association with the ovaries, are the factors most concerned in the final development of the female genital organs. It will easily be understood how important a matter it is that all cases of delayed puberty—both in major degree where the patient remains childlike altogether, and in the minor degree where she is well developed in every particular except in regard to the genital functions—should be carefully taken in hand at the earliest possible moment. These patients are frequently obese, consequently this condition has been considered to be a primary cause of delayed puberty. This is not so; both conditions are dependent on the same cause.

Many cases can be treated successfully with thyroid extract, and some with pituitary extract in large doses. Extract of the whole gland should be prescribed.

There appears to be little chance of effecting full development of the uterus after the age of 20 years. This, at first sight, appears to be a somewhat curious fact, for one might think that if a uterus can be, and normally is, roused into activity after fifteen years of primary inactivity, ten more years of quiescence would make no difference. It must be remembered, however, that the body metabolism alters rapidly after the eighteenth year of life, when the development of the skeleton is practically completed; so that, unless genital activity be aroused during the period of change, it is impossible sufficiently to control the metabolism, which has become rearranged, in order to produce the effect desired.

Derangements of the Fully Established Female Characteristics and Functions.

Derangements of the Sexual Characteristics.

The secretions of the endocrinous glands which have produced the normal female continue subsequently to act in the same way—passively, no doubt—and it is only some extensive alteration in the structure and function of certain units of the internal secretory system which can bring about an alteration in the female sexual characteristics once they have been determined, and the genital organs have become functionally active. So far as we know, the withdrawal of any one secretion will produce no change. There must be some overgrowth in those parts of the endocrinous system, apart from the genital glands, which normally produce masculinity—a potentiality which appears to be concentrated in the suprarenal cortex, the pituitary body, and probably in the pineal. Apert[1] has asserted that masculine characteristics may be produced in women by simple ovarian tumours. But, as Glynn[11] points out, there is no evidence in the cases reported that the suprarenals were examined, or, I might add, the pituitaries and pineals.

In adult women, before the menopause, the changes towards masculinity associated with suprarenal hyperplasia and neoplasia may be most marked. Menstruation ceases, the breasts shrink, hair grows on the face, the voice deepens; and last, and not least, profound psychical changes have been known to occur, a previously gentle woman becoming rough and aggressive. A number of such cases have recently been collected by Glynn.[11 11a]

With acromegaly, too, I have seen a somewhat similar change. In one case menstruation ceased, the skin became coarse, the voice deep, the breasts shrunken, and last, and most interesting of all, the clitoris hypertrophied until it resembled a small penis. We know that in the male acromegaly (hyperpituitarism) at first gives rise to increased sexuality, so that the reverse obtains in the female in whom there is a tendency towards masculinity. In the case of the internal secretions of the pituitary, therefore, we see evidence of a difference of sex stimula-

* It has already been mentioned that the uterus may be malformed owing to local pelvic conditions, with full development of the ovaries. In such circumstances puberty occurs, although the uterus may be functionless.

tion in the male and the female, just as we saw it in connexion with the suprarenals and pineal.*

These, then, are the main facts in connexion with the maintenance and alteration of sex characteristics in the adult female.

Derangements of the Genital Functions.

In considering derangements of the fully established functions I shall take in order each of the chief organs of internal secretion and endeavour to show how they are individually related to the various disorders met with. In some cases we have to take into account certain correlations; especially is this so where the ovary is concerned.

Primary disorders of the endocrinous organs may be considered as giving rise to insufficiency or excess of the normal secretions.

Ovarian Insufficiency.

Ovarian insufficiency occurring during the active sexual period is rare as a primary disorder, except when produced by operative interference. As we have already seen, when the ovaries are removed experimentally definite changes occur in the general metabolism, in the uterus and in the structure of the other organs of internal secretion; and these changes appear to be more prominent in the higher than in the lower mammals.

From observations made on the human subject there is no doubt that a similar train of events follows complete oöphorectomy. In addition, however, there are frequently to be noticed psychical phenomena, which are doubtless dependent on the general disturbance of the metabolism; but marked individual variations exist in the symptoms produced just as normally there are considerable variations in the femininity and sexuality of different women. Unfortunately, those who have asserted that oöphorectomy is of small moment to the patient have failed to make good their scientific position in the matter by the exercise of a discretion that appears obvious in view of what has been said regarding individual variability. If one were to gauge, and in many cases it would not be difficult, the degrees of femininity and ovarian activity in the patient, it might be possible to assert that in those cases in which these were obviously in abeyance little disturbance of the metabolism would result; and, consequently, it might be justifiable in such cases to remove the ovaries with a fibromyomatous uterus or with infected tubes. But unless such a scientific distinction, which undoubtedly does exist and accounts for the individual variations after oöphorectomy, be made, it does not seem right blindly and systematically to remove the genital glands.

It is more or less generally supposed that the natural menopause occurs in women as the result of an ovarian insufficiency. Undoubtedly there is ovarian insufficiency sooner or later, but it has always seemed to me that the symptoms produced depend for their severity on the correlations that exist between all the internal secretions, on the uterine changes which prevent the monthly excretions, and, lastly, on individual variability as to sexuality and to the stability of and capacity for readjustment in the endocrinous system. That the phenomena associated with the natural menopause partly depend on ovarian insufficiency is proved by the onset of similar manifestations in most women after oöphorectomy. That they are related to the coincidental uterine atrophy is proved by the fact that women may suffer from these same symptoms after removal of the uterus alone. Also, I have seen monthly molimina which reminded one strongly of some of the symptoms of the menopause in women in whom there was congenital absence of the uterus or malformation sufficient to prevent menstruation, together with functional ovaries. Finally, the natural menopause varies in its severity in different women, just as does the artificial; but probably chiefly according to the extent of the femininity, which is accentuated by ovarian activity.

The main types of menopausal phenomena to be observed clinically may be classified as follows:

1. Psychical.
2. Vasomotor.
3. General metabolic.
4. Gross changes in the endocrinous glands.

Thus we may observe:

1. Mental irritability or instability.
2. Flushing with sweating, cardiac distress, and intestinal movements.
3. The deposition of fat and the retention of calcium salts in the tissues.
4. Excessive changes in the endocrinous glands, especially the thyroid and pituitary body. One of my patients died of exophthalmic goitre one year after the removal of both ovaries for malignant disease. Myxoedema, which recent views associate with previous excess of secretory activity in the thyroid, also usually occurs after the menopause. The changes in the pituitary are less noticeable, but the deposition of fat may be the result of what is known as carbohydrate tolerance, due to hypopituitarism. This condition is always seen in the disease known as dystrophia adiposo-genitalis.

It must be remembered, of course, that the phenomena mentioned above are classified clinically. They are all primarily due to disturbances in the endocrinous organs.

The information required before we can speak with certain knowledge about the changes at the menopause is considerable. Work must be done on the normal age changes in the endocrinous glands, and especially the changes that occur at the menopause; and the metabolism before, during, and after the menopause must be worked out in a number of cases and compared. But however little we know about the metabolism of, and the structural changes in, the glands of internal secretion at the natural menopause, we recognize the fact that the more gradual the onset and completion the less the general disturbance. Many women, of course, have prolonged and distressing menopauses, but in some, at least, I am inclined to think that the menopausal retrogression is spasmodic rather than continuous. The cases of the natural menopause in which the disturbance is great are undoubtedly those which occur suddenly, and for this reason the artificial menopause is liable to be more serious than the natural.

There seems, too, to be some relation between the severity of symptoms and the age of the patient. In this respect, I believe, the natural often differs from the artificial menopause. When it occurs in young women (35 to 40 years of age) naturally, or pathologically as in superinvolution of the uterus, the symptoms are usually slight. Possibly this is because the genital functions in such women have never been predominant. When the natural menopause occurs in elderly women (50 to 55) the symptoms are often severe. On the contrary, the artificial menopause usually produces far worse effects in young women than in those over 45 years of age, the degrees of femininity being equal.

To complete the picture of ovarian insufficiency it is, necessary that we should turn for a moment to the question of the ovarian secretions in pregnancy. It was first shown by Fränkel[10] that destruction of the corpus luteum in the early stages of pregnancy inevitably caused abortion in animals. Hick and I[5] and others have confirmed the importance of the ovarian secretions in the implantation of the ovum in rabbits. But this does not hold good to the same extent in the human subject, for both ovaries have been removed as early as the sixth week of pregnancy without producing abortion. In such cases the question of the entire removal of the ovary is easily settled by the subsequent history of the patient. At the same time it is almost certain that the initial implantation of the ovum could not occur in the absence of the secretion of the corpus luteum. And, indeed, such insufficiency may be the cause of many early abortions.

It has been suggested that during pregnancy ovulation does not occur, and that the internal secretions of the ovary, apart from that of the corpus luteum, are in abeyance. I do not think there is any real evidence in support of these statements. Nevertheless, if such were the case, it might indicate that ovarian insufficiency during pregnancy threw a considerable strain on the other organs of internal secretions such as the thyroid and anterior lobe of the pituitary, and, in fact, might be the original cause of some hyperplasias in these structures.

When we consider the treatment of ovarian insufficiency, the question of ovarian transplantation naturally first crosses our minds. Experimental and operative evidence goes to show that autogenous grafts alone are of service. In rabbits, grafts from one animal to another have been

* The thymus *appears* to take no part in the regulation of sex characteristics, in spite of its supposed influence over the formation of the skeleton. Further investigations may, however, prove that it is so concerned.

shown to be effective, but only for a short time. Professor Tuffier of Paris has found that, in the human subject, only autogenous grafts are of any use at all. Ovarian transplantation, therefore, can only be employed in *mitigation* of the artificial menopause. That is to say, autogenous ovarian grafts may be of value in women under 40 years of age in whom both ovaries have been removed; but they can be employed only in those cases in which the lesion is not malignant. Thus there is a very restricted field for this method of treatment, especially when we remember how rarely it is necessary entirely to sacrifice the whole of both ovaries in other pathological conditions. In the circumstances indicated, however, I believe it to be a most valuable and even imperative procedure. When a graft is made, it is better, I think, to use a thin, flat, or wedge-shaped piece of ovary without the cortex, in order that the extensive raw surfaces may quickly obtain attachment and an efficient blood supply be established, and that by the removal of the cortex cyst formation in the follicles, which is otherwise inevitable, may be avoided. Recently I saw Professor Tuffier of Paris implant an ovary. He simply buried the *whole* ovary in the anterior abdominal wall. This appears to me a very bad technique, for the reasons indicated above. In any case, as far as we know, the menopause is only postponed and thereby mitigated by ovarian implantation.

Excessive Ovarian Secretion.

The clinical effects produced by excessive ovarian secretion may be discussed under two headings:

1. Effects on the sexual functions, characteristics, and psychology.
2. Effects on the general metabolism.

It must not be forgotten that the effects mentioned in the first group are chiefly dependent on alterations in the general metabolism.

1. An excessive ovarian secretion leads to an increase in sexual activity both locally and generally. The local effects may be seen in an increased and prolonged menstruation. This condition occurs chiefly in girls about and just after puberty who indulge in masturbation or are sexually insane, in unmarried women over 30 years of age, and in women whose married life is a failure from a sexual point of view.

Before long it is probable that we shall find that injections of suprarenal and pituitary extract may be employed to control the effects of excessive ovarian secretion, and in these circumstances operation will not be called for.

2. An excessive ovarian secretion affects the metabolism in the opposite way to oöphorectomy, and one of the most important metabolic disturbances is the abnormally large excretion of calcium salts. In the non-pregnant woman this is a matter of no importance so far as the skeleton is concerned, but it possibly accounts for some of the nervous and muscular irritability, which are constant features of these cases. In pregnancy and lactation, however, there is a large demand for calcium over and above the amount necessary for the normal maternal metabolism, and, as a result, softening of the bones may occur. This condition is known as osteomalacia. Such cases are not common in some localities, and personally I have not seen a case for many years. This disease used to be treated by removal of the ovaries, and many patients were cured. A few years ago Bossi, of Genoa, suggested the injection of suprarenal extract as an alternative to oöphorectomy. Apparently many cures have been effected by this treatment, and also by the injection of pituitary extract. So that it may be argued that there is insufficiency in these organs, as well as an excess of ovarian secretion; and this, indeed, is quite possible. Be this as it may, substitution of other extracts is a great advance on removal of the ovaries in the treatment of osteomalacia; and the success thus obtained indicates the line of attack that will probably be followed in the future in regard to all those diseases of the endocrinous glands in which there is an excessive secretion. That is to say, metabolically antagonistic extracts will take the place of removal of portions of the diseased organs.

By way of further illustration I may here mention that, as I suggested some time ago, the injection of pituitary extract is an excellent method of treatment in hyperthyroidism. Suprarenal and pituitary extracts counterbalance the action of the ovaries and thyroid and lead to calcium retention, which, as we have already seen, is a normal function of the suprarenals and pituitary. It is probable that both portions of each of these structures are concerned in the result.

Thyroid Insufficiency.

Thyroid insufficiency always causes a decrease in or the complete cessation of the function of menstruation, according to the degree of insufficiency. I have already alluded to the complete atrophy of the uterus which follows thyroidectomy in animals; and it will be remembered that I pointed out that in my experiments the ovaries were not found to undergo atrophy, but rather to show increased activity. Apparently in the human subject atrophy of the uterus is never complete with pathological insufficiency of the thyroid, not even with myxoedema; for I have known a patient, who had had this condition for some years, not only to menstruate, but to conceive after the administration of thyroid extract.

It is, however, the disturbances arising from minor degrees of thyroid insufficiency which chiefly come under our notice as gynaecologists. Delayed menstruation has already been discussed. Secondary amenorrhoea and scanty menstruation, the latter often associated with dysmenorrhoea, are very frequently seen with thyroid insufficiency. The patients are obese, lack energy, and have deficient sexuality. There is another menstrual disturbance—namely, mastodynia—which sometimes occurs regularly each month before the onset of menstruation, in which I have found thyroid extract of great service; and in consequence of this I believe that the condition may be indirectly connected with thyroid insufficiency. If thyroid extract be given from about the twenty-fourth day of the cycle till menstruation is established this function may come on earlier than usual, with relief of the pain in the breasts. There is a natural aversion from prescribing thyroid indiscriminately, but in these minor degrees of insufficiency thyroid extract is the one preparation which will cure the patient. I have seen quite remarkable results in a number of cases. I always order the preparation—usually 3 grains of the dried gland—to be taken only on going to bed at night. If given in this way and not during the day the patient never suffers from ill effects.

With regard to pregnancy, it is well known that normally the thyroid gland enlarges in the early stages, but I need not here go into the causes of this. It shows that increased thyroid activity, which, I believe, takes the form of a storage of colloid, is required. A marked degree of insufficiency, such as is seen in myxoedema, almost invariably leads to sterility. Cases have been recorded in which pregnancy has occurred in minor or variable states of this disease; and in such circumstances a notable improvement may be produced in the general condition, the thyroid becoming more or less active.

There is one more point in regard to thyroid insufficiency and pregnancy which requires some comment. Nicholson[15] promulgated the view, which has been taken up by many others, that eclampsia was due to thyroid insufficiency in pregnancy. I conducted a series of experiments—reported elsewhere[4]—to find out how far this was true; and I came to the conclusion that neither metabolically nor actually was there any real evidence in support of Nicholson's view. Indeed, it appeared to me that the animals in the later stages of pregnancy were considerably less affected than those which were not pregnant. I have accounted for this curious fact by assuming that in the later stages of the development of the fetal thyroid its secretion may be conveyed to the mother. The thyroid, of course, has a most important part to play during pregnancy, but I do not think it has anything to do primarily with the causation of eclampsia.

Excess of Thyroid Secretion.

It is a common experience to meet with an excess of thyroid secretion in connexion with pelvic lesions, and we must be careful to distinguish between those cases which are the result of genital affections and those which are the cause of them. It is certain that after the menopause the thyroid normally undergoes some retrogression, after, perhaps, a period of minor hyperthyroidism; and it is probable that removal of the ovaries leads. eventually a

all events, to the same condition in the majority of cases. But, as I have mentioned, acute exophthalmic goitre may intervene. Experimentally it is seen that a considerable increase in the colloid formation follows oöphorectomy, but it is probable that this is a different condition from Graves's disease. At the same time we really know far too little about exophthalmic goitre—especially in its relation to simple goitre and to myxoedema, with which it not infrequently alternates—to speak definitely on this question. Excessive thyroid secretion may act on the genital functions in two ways. First, it may stimulate them to unusual activity, or, secondly, the general metabolism may be so upset that the genital functions cease. I am quite certain that there is a condition of hyperthyroidism which produces excessive menstruation, and which is totally unassociated with any of the symptoms of exophthalmic goitre. This condition is usually seen in girls about puberty usually just before and during menstruation. It may be that the excessive activity is due to the incomplete functional development of the ovaries; but, whatever the cause, there is not infrequently menorrhagia. I have, however, seen this same enlargement of the thyroid with amenorrhoea. This paradoxical phenomenon is easily explained on the supposition of ovarian insufficiency, and an inability of the thyroid in some cases, in spite of its enlargement, to meet the deficiency. When there is menorrhagia I have found that it can always be controlled by calcium lactate.

The relation of excessive thyroid secretion to conception and pregnancy is very interesting, and much has been written on the subject. I think there can be no doubt that excess of thyroid secretion, except that seen in connexion with exophthalmic goitre, does not interfere with fertility. It would be strange if it did, since we know there is an increase of thyroid activity during the early months of pregnancy, and possibly throughout. But it is no less a fact that women with marked exophthalmic goitre rarely become pregnant, and if they do the disease is aggravated. I remember one patient who had suffered from exophthalmos for some years, yet she had had several children, but there had always been haemorrhage *post partum*—an occurrence which has frequently been noted in these cases. She consulted my colleague, Mr. Thelwall Thomas, and he removed one half of the thyroid gland, with the result that there was marked amelioration in her symptoms. Shortly afterwards she became pregnant again, and Mr. Thomas referred her to me for observation and treatment. She became somewhat worse than she had been since her operation, so I gave large doses of calcium lactate and ordered rest. She went comfortably to full term, and there was no haemorrhage *post partum*. I advised her not to nurse the child, which was normal. She improved very considerably after parturition, and is now, so far as I know, in good health. I think it is most important that these patients should be given large doses of calcium salts if they become pregnant, as there is such an excessive excretion of lime salts in this disease, and so much danger of haemorrhage *post partum* and even *ante partum*. Infundibulin should be given immediately after labour, to prevent bleeding.

Pituitary Insufficiency.

We have seen that, like the thyroid, the pituitary is actively concerned in the proper development and the maintenance of the genital functions. Consequently, as we would expect, insufficiency of secretion is associated with amenorrhoea or scanty menstruation. I have already mentioned the fact that various investigators claim for different portions of the pituitary body different functions, and I have stated my belief in the unity of the whole gland. Patients with pituitary insufficiency are always obese and dull, and it is often a difficult matter to say whether the thyroid or the pituitary, or both, be at fault. Sometimes it is quite impossible to make sure, and in such cases one can only try first one and then the other extract. I have occasionally given both together, for we know from experiments that a very intimate connexion exists between these two organs. If it be true that there is atrophy of the ovary with pituitary insufficiency, as described by Cushing, it would probably be useful to give both pituitary and ovarian extract together. I have shown that ovarian atrophy does not occur with thyroid insufficiency in adults, and therefore I am somewhat sceptical as to the findings of Crowe and his co-workers, already alluded to, in regard to the ovaries with pituitary insufficiency. Sometimes the condition of the skin may help one in forming an opinion as to which gland is at fault. If it be dry and rough one would suspect the thyroid, if fine and smooth it is more likely that the pituitary is at fault. I have come across no case recorded in which a patient suffering from a major degree of pituitary insufficiency has become pregnant. As already mentioned, pituitary extract appears to act as well as suprarenal extract in osteomalacia, so that it is possible that there is a minor degree of insufficiency of the pituitary body in this disease.

Excess of Pituitary Secretion.

We have seen that an excess of pituitary secretion, such as occurs in acromegaly, produces masculinity, and while in the male this may give rise to excessive sexuality, in the female it causes amenorrhoea and loss of desire, as is only natural if masculinity be produced. The amenorrhoea may be spasmodic, for acromegaly tends to improve for a time and then again to retrogress. Cushing[9] has shown that eventually acromegaly (hyperpituitarism) changes into dystrophia adiposo-genitalis—a condition of pituitary insufficiency. The effect of excessive pituitary secretion must, therefore, necessarily tend to produce sterility. A case, however, has recently been recorded[12] in which a woman suffering from acromegaly conceived after having been treated, before becoming pregnant, with ovarian extract, which was believed to have improved her general condition and to have caused the appearance of menstruation. I have myself seen an improvement with the reappearance of the menses take place in acromegaly under ordinary circumstances. So that it is difficult to say with certainty that pregnancy resulted in the above case from the treatment with ovarian extract.

Suprarenal Insufficiency.

This condition has only received clinical recognition in Addison's disease, in which there is an extensive derangement of the metabolism. The amenorrhoea that is found in this disease is probably due partly to the general disturbances and partly to uterine atrophy. I know of no record of a proper *post-mortem* examination of the genital organs in this disease. Experimentally I have found a moderate grade of uterine atrophy with suprarenal insufficiency.

We have already seen that the administration of suprarenin has been successfully employed for osteomalacia. This, as I have pointed out, may be not only because suprarenin is antagonistic to the ovarian secretion, but also because in this disease there may be suprarenal insufficiency, a supposition which is supported by the fact that in one case in which I produced experimentally suprarenal insufficiency in a rabbit the bones of the forelegs became bowed. Further, in most of the animals operated on there was an enormous increase in the urinary excretion of calcium. It appears, therefore, that the secretions of the suprarenals are of great importance during pregnancy in assisting the absorption and retention of lime.

Excess of Suprarenal Secretion.

There is little to add to what has already been said concerning the sex changes that occur in adult women with suprarenal cortical hyperplasia. Amenorrhoea is a constant phenomenon, and pregnancy never occurs in well-defined cases. At present we have no remedy for suprarenal hyperplasia, but in the future some treatment may be forthcoming for the minor degrees of this condition, and this will probably be of the nature of an antagonistic combination of secretions. That there are many cases of slight hyperplasia which go unobserved seems probable, for it is a question whether the shame of a moustache or pride in masculinity has the greater weight with some women. I have such a case under observation at the present time. The patient is aged 19, her menses have ceased, and she has a masculine voice and appearance. The growth of hair on the face alone is required to complete the picture.

Thymus Insufficiency.

This, so far as we know, is natural after puberty. It is possible that in cases of early retrogression of the

thymus sexual precocity occurs. It is difficult, however, to know which is the cause and which the effect. Further clinical investigations should throw light on this question.

Excess of Thymus Secretion.

In the condition known as status lymphaticus there is abnormal persistence of the thymus, and since the secondary or pubescent development of the sexual organs is associated with retrogression of the thymus there is under-development of the genital organs with amenorrhœa if the thymus persist. Individuals with a persistent thymus usually die early, and I do not think the condition has as yet been considered at all seriously from the genital point of view. Retrogression of the thymus might be assisted, if the view be true that development of the genitals causes retrogression of the thymus—a question which has already been discussed.

REFERENCES.

[1] Apert, *Bull. méd.*, December 21st, 1910. [2] Aschner, B., *Wien. klin. Woch.*, 1909, xii, p. 1730. [3] Bell, W. Blair, *Proc. Roy. Soc. Med.*, July, 1909. [4] Idem, Arris and Gale Lectures, *Lancet*, March 22nd and April 5th, 1913. [5] Bell, W. Blair, and Hick, P., BRITISH MEDICAL JOURNAL, March 13th, 1909, p. 656. [6] Biedl, A., Innere Sekretion, Berl., 1910. [7] Bulloch, W., and Sequeira, J. H., *Trans. Path. Soc.*, 1905, lvi, p. 189. [8] Crowe, S. J., Cushing, H., and Homans, J., *Bull. Johns Hopkins Hosp.*, 1910, xxi, p. 127. [9] Cushing, Harvey, The Pituitary Body and its Disorders, 1912. [10] Fränkel, L., *Arch. f. Gyn.*, 1905, lxxv. [11] Glynn, E. E., *Quart. Journ. Med.*, 1912, v, No. 18, p. 156. [11a] Glynn, E. E., and Hewetson, J. T., *Journ. Path.*, 1913, xviii, p. 81. [12] Kelleday L., *Zentralbl. f. Gyn.*, 1913, xxviii. [13] Linser, P., *Beitr. z. klin. Chir.*, 1903, xxxvii, p. 282. [14] Lucas, R. C., *Trans. Clin. Soc.*, 1888, xxi, p 224. [15] Nicholson, H. O., *Scot. Med. Surg. Journ.*, June, 1901. [16] Orth, Arbeiten aus den Path. Institut zu Göttingen, Berl., 1893 (quoted by Bulloch and Sequeira). [17] Paton, Noel, *Journ. Physiol.*, 1904, xxxii, p. 59.

EPIDEMIC CERVICAL ADENITIS.

BY

J. GORDON SHARP, M.D.EDIN.,

LEEDS.

DURING the spring we had in Leeds a long-continued epidemic of influenza of a moderately severe type. Side by side with this there had been in some districts numerous cases of mumps, diphtheria, and measles, but amongst the cases of illness there were some which could not be fitted with a diagnostic label. The obscurity attaching to them is now removed to some extent by the descriptions given in the article which appeared in the JOURNAL of June 14th, 1913, p. 1282, entitled "An Epidemic characterized by Adenitis, Tonsillitis, and Cardiac Complications."

I cannot say how many cases I have seen—perhaps twenty, thirty, or more in all—for at first they fell into that long list of undescribed conditions which we all meet with; and it was only when some half-dozen cases of more than ordinary severity were seen that one took special notes with a view to arriving at an exact diagnosis. These were as follows:

CASE I.—*Cervical Adenitis and Tonsillitis.*

The first case that arrested my attention was a girl of 12, who in April, 1913, had a swelling at the angle of both jaws and in the triangles of both sides, with a red rash, limited to the neck, which completely disappeared after half a day. There was slight swelling of both tonsils, an oedematous uvula, a white-coated tongue, and a temperature which never was higher than 101°, a pulse of 110, stiffness of the neck and shoulder muscles, malaise, nausea, complaint of palpitation and pain at the pit of the stomach. One is almost ashamed to write that the diagnosis varied between rheumatism, influenza, German measles, mumps, and diphtheria. Rheumatism because a brother and sister suffered from heart disease, the result of this affection, and because of the stiffness from which the girl herself suffered; influenza because it was prevalent; German measles because of the rash; diphtheria because it, too, was then in evidence, but a swab cleared this up; mumps because three cases had occurred in the near neighbourhood. All were excluded and the diagnosis was left blank. The most prominent signs and symptoms were the cervical adenitis, which persisted for more than a week after the acute symptoms; the rapid heart action, which persisted for three weeks; and the later debility.

CASE II.—*Cervical Adenitis, Measly Rash, and Tonsillitis in an Adult.*

This patient, seen in April, 1913, was a lady of 35, who had a large swelling at the angle of the left lower jaw, and the same on both sides of the sterno-mastoid muscle, accompanied by a measly rash on ths neck, chest, and hands, which appeared suddenly and disappeared suddenly within two days. The tongue was coated white and the tonsil on the left side was large and purple red. There was great stiffness of the muscles of the neck. The pulse was 120, and palpitation was complained of. The temperature rose to 103° on two days. There was nothing suggesting quinsy. One morning she said she was sure something had burst in her mouth, and she complained of a salty taste for two or three days. After this the tonsil decreased in size and the swelling on the jaw also disappeared. The stiffness remained long after all acute symptoms had gone. The swelling of the glands along the sterno-mastoid muscle did not go till four weeks after its first appearance, and convalesence was not established till this time. The exhibition of the hypophosphites and Fowler's solution seemed to hasten the disappearance of the enlargement.

CASE III.—*Mild Cervical Adenitis.*

A boy of 7 was suddenly seized in March, 1913, with a temperature of 101°, headache, slight sore throat, and enlarged glands on both sides and in both triangles. He got rapidly well on 5-gram doses of sodium salicylate, but the glandular enlargement remained for over fourteen days, much to the anxiety of the parents, who feared acute tuberculosis. The boy ultimately got quite well.

CASE IV.—*Adenitis with Moderately Severe Tonsillitis.*

A girl of 11 had stiff neck, enlarged glands at the angle on both sides, swelling in both anterior triangles, enlarged tonsils, especially on the left side, and on this side there was a patch of yellow which it was thought might be diphtheria. A swab gave a negative result, and the child soon got well as far as the acute symptoms were concerned. The temperature was never higher than 102°. The glands in the anterior triangles did not go away till the girl was up and moving about.

CASE V.—*Very marked Glandular Enlargement with Severe Constitutional Symptoms.*

A girl of 13 was taken ill with headache, stiffness of neck and shoulders, temperature of 103°, sickness, vomiting, large swelling at the angles, in the triangles, tender tonsils, and oedematous uvula. Under time and treatment the mouth symptoms, swellings at the angles, and the sickness and vomiting cleared away, but the swelling of the glands remained in the triangles till the child was able to be out—some three weeks after the commencement of the illness. Earlier in the year four brothers (she was the only girl in the family and slept alone) and the father and mother were all laid up with influenza.

CASE VI.—*Enlarged Cervical Glands, Tonsillar Abscess, and Palpitation.*

A woman of 25 was seized in May, 1913, suddenly with pain in the throat, stiff neck, enlarged glands at the angles and in both triangles, epigastric pain, suffocating feeling, palpitation, and a temperature of 103° in the armpit. On examining the mouth the tonsils were swollen and red, but more particularly on the left side (by a strange coincidence the left side is nearly always the more severely affected), which was bulging. On the third day this swelling burst and discharged pus and blood, and left a ragged opening. The heart was 140, and the first sound in the mitral area was not clear; but this was not seriously considered, for the patient is somewhat "nervous." This may have been a mistake on my part, and the heart condition may have been part of the general disturbance. The swelling at the angles of the jaw rapidly subsided, but in the case of the glands along the sterno-mastoids the subsidence only took place gradually and only after a few weeks. The convalescence was prolonged.

In all the cases the tonsils played an important part, and they may have been the seat of entry of infection. I can now recall several cases of a mild nature having occurred in families, so that the disease may be of a nature which is communicable from person to person; and I now see cases in which stiffness along the sterno-mastoids is complained of, and on examination tender glands are discovered near the muscle. Are they late cases of the kind now under review? They disappear on being treated with organically combined iodine and massage.

THE will of the late Mr. Walter Whitehead, consulting surgeon to the Manchester Royal Infirmary, has been proved at £176,892 net. Among the bequests are £250 to the North Wales University College, and an annuity of £20 to the Manchester Royal Infirmary for the Bradley scholarship.

WE learn from the *Australasian Medical Gazette* that in order to promote research in cancer Mr. John Grice, a member of the Melbourne University Council, has offered a sum of £1,000, to be spent at the rate of £125 a year, to establish a scholarship for work at the University and the Melbourne Hospital. The State Government makes an annual grant of £1,000 to the University for research purposes, and the Minister of Education recently conferred with Dr. MacFarland (the vice-chancellor) and Dr. J. W. Barrett, and agreed to raise the amount to £1,125 for three years, so that the extra £125 could be devoted to cancer research during that period.

TREATMENT OF GONORRHOEAL EPIDIDYMITIS BY BIER'S METHOD.

By A. C. WILSON, M.R.C.S.Eng., L.R.C.P.Lond.,
LATE SURGEON, R.N.

The treatment of epididymitis is at all times a tedious affair, wearying to the doctor but infinitely more so to the patient. In a public service such as the army and navy, where every hour's delay is so much time lost to the State, it is especially important that every means should be adopted to avoid protraction in the treatment of disease. After some little experience I have been led to believe that the best results are obtained by a combination, where possible, of existing methods with Bier's passive congestion, modified to meet the requirements. The treatment can be used in all chronic and a great many acute cases. By this means the period of disease is in almost every instance reduced by nearly half as compared with existing methods alone.

Method of Application.

In applying passive congestion to a testicle for the treatment of gonorrhoeal epididymitis, all that I use is a strip of lint 1½ in. wide, a fine piece of rubber tubing, and a pair of Spencer Wells forceps. The cord on the affected side is encircled just above the testicle by the strip of lint, which is continued round between the two testicles along the median raphe of the scrotum. Over the lint is applied the rubber tubing, which is tightened to the required extent and secured by artery forceps. (The required extent being such that no pain results after the application; instead, the patients describe a comfortable warming sensation with immediate relief of pain.) Pain after application implies that the tubing is too tightly applied, and suggests that it should be loosened. A few moments after adjustment the enclosed tissues assume a purple colour resembling a ripe plum. The treatment is applied for an hour the first day, where possible, increasing daily up to as much as eight hours. But in some very acute cases half an hour will be all that the patient can stand at first (vide Case II). Where practicable, however, it will be found that the duration of disease is in inverse ratio to the length of daily application of treatment.

The following series of six cases may be of interest:

Case I.

G. C., aged 26, came on the sick list on April 3rd, suffering from gonorrhoea. On April 14th he developed right epididymitis, which was at first treated by bed, the ordinary initial purge, subsequent urinary antiseptics and diuretics, together with local applications of lotio plumbi cum opio.

On April 24th, as little or no improvement took place, treatment by passive congestion was commenced. The application in this case was applied for an hour the first day, increasing daily up to as much as eight hours.

On May 2nd all pain and tenderness had disappeared; treatment was therefore discontinued.

The patient had to remain on the list until May 7th for treatment of the urethral discharge.

He was thus under treatment for epididymitis altogether from April 14th to May 2nd—eighteen days—during the latter eight of which only was he treated by Bier's method.

Case II.

G. T., aged 29, was admitted to the sick list on April 9th, suffering from gonorrhoea and acute right epididymitis. On April 10th passive congestion was applied for two hours. On April 11th, however, as there was slight pyrexia with pain in the back, the treatment was temporarily discontinued. It was recommenced on April 14th for half an hour, and continued systematically until April 20th for increasing periods of time. Then all swelling and tenderness had disappeared. Seven days' continuous treatment, in this case, sufficed for a cure.

The cause of the initial pyrexia and pain in the back was perhaps due to an over-zealous primary application of treatment, two hours proving more than the patient could stand.

Case III.

B. L., aged 26, was admitted to the sick list on April 3rd, suffering feom gonorrhoea and right epididymitis. The routine application of lotio plumbi cum opio, alternating with fomentations frequently applied to the testicle for two days, did not relieve the pain. On April 5th, therefore, treatment by passive congestion was commenced, which was continued until April 9th, when all pain and tenderness had disappeared. Some slight thickening, however, remained for some few days longer. In this case a cure was effected after four days' trial when other treatment had little effect.

Case IV.

R. C., aged 19, came to me on May 5th suffering from gonorrhoea and right epididymitis. On May 6th Bier's treatment was applied for one hour, and continued with increasing but intermittent applications until May 19th, when all signs of the inflammation had vanished. In this case thirteen days' treatment were necessary to effect a cure. This was the most obstinate one of the series, due, I fancy, to the fact that the treatment was irregular and not a daily routine.

Case V.

W. H. T., aged 28, was a case of chronic gleet, in the course of which the patient developed an acute attack of epididymitis. From the first this case was treated by passive congestion, and it cleared up entirely in six days (from May 12th to 17th), when all signs of inflammation had subsided.

Case VI.

The last case was a patient aged 20, who suffered from gonorrhoea and right epididymitis. He came to the sick quarters on May 19th. For the first two days the ordinary methods of treatment were tried, when, by request of the patient, the special treatment was carried out, at first for an hour daily and then for longer periods, with very satisfactory results. On May 26th there was but slight thickening of the globus major and very little tenderness on deep palpation. The treatment was thereupon discontinued, after but five days of passive congestion.

Taking at random the records of four other cases treated by the ordinary orthodox methods, we get the following comparative table, though in both cases the patients had to attend subsequently for treatment of their urethral discharge:

Cases Treated by Usual Methods.	Length of Treatment.	*Cases Treated by Passive Congestion.*	Length of Treatment.
Case I	17 days.	Case I	9 days.
Case II	24 ,,	Case II	7 ,,
Case III	11 ,,	Case III	4 ,,
Case IV	10 ,,	Case IV	13 ,,
		Case V	6 ,,
Total	62 ,,	Case VI	5 ,,
		Total	44 ,,

Taking the aggregate number of days for the first four cases in each instance, we get 62 days' sickness in the first series as compared with 33 days in the second. This means a saving of 29 days, or in other words, a week's extra work per man, which in Government employ is a fact not to be despised.

The primary application was always made with extreme care, the manipulation of an acutely inflamed epididymis being necessarily painful; but in all cases directly the bandage was in position the cessation of pain was instantaneous.

Unfortunately, owing to recent lack of material, I have been unable to give this method a more protracted trial, but I venture tentatively to put it forward as a suggestion for further trial in large institutions. In all these cases, of course, the strictest care was taken to ensure that the patient remained confined to bed, and the ordinary routine as regards general treatment was carried out.

The French Society of Exotic (or Tropical) Medicine has passed a resolution calling on the French Government to take steps to prevent the spread of opiomania in France and to destroy existing hotbeds of the habit. The Society asks that the use of opium be forbidden in France and in the colonies to officers, military and naval, under severe disciplinary penalties. It is further urged that the Government of Indo-China should take the necessary steps for the gradual suppression of the opium trade in conformity with what is being done in adjacent countries, and that it should rigorously enforce the measures already adopted. The principal of these are the exclusion of opium smokers from public offices; teaching in schools and in lectures, and leaflets addressed to the public pointing out the dangers of opium; and the establishment of hospitals for the treatment of opiomaniacs. The society further calls on Colonial governors to take the necessary steps to ensure that cocaine, morphine, alkaloids derived from opium, as well as preparations described as "anti-opium," shall be allowed to pass the Customs only when consigned to European pharmacists. These pharmacists must enter the import and export of these drugs in a special register open to inspection.

EIGHTY-FIRST ANNUAL MEETING
OF THE
British Medical Association.

Held in Brighton on July 23rd, 24th, and 25th.

PROCEEDINGS OF SECTIONS.

SECTION OF TROPICAL MEDICINE.

Lieutenant-Colonel Sir WILLIAM LEISHMAN, F.R.S., President.

DISCUSSION ON DYSENTERY.

OPENING PAPERS.

I.—S. R. DOUGLAS, M.R.C.S., L.R.C.P.,
Assistant Director Inoculation Department St. Mary's Hospital; Late Captain I.M.S.

NOTES ON AMOEBIC DYSENTERY FROM PAPERS PUBLISHED DURING THE PAST YEAR.

UP to the year 1907 the generally accepted life history of the amoeba causing dysentery was that described by Schaudinn. The most notable point in this description was the formation of small spore-like cysts instead of what is common in many other amoebae—a large cystic stage. This amoeba was named by Schaudinn the *Entamoeba histolytica*.

In 1907 Viereck described the life history of an amoeba found in cases of dysentery, which he named *Entamoeba tetragena*, from the fact that well-marked cysts containing four nuclei were formed. This amoeba he believed to be distinct from *E. histolytica*, and to constitute a further pathogenic species.

At the present time many observers—for example, Darling and Wenyon, believe that Schaudinn's description of the life history of the amoeba causing dysentery is erroneous, and that the true life history of this organism is that described by Viereck. Darling and James have also investigated another amoeba, the *Entamoeba minuta*, described by Elmassian, and believe it to be a stage in the life histo , of *E. tetragena*. Lastly, Darling and Ornstein have come to the conclusion that *E. nipponica* is also a form of *E. tetragena*.

There are, however, observers—for example, Craig, Ornstein, and James—who believe that there is a pathogenic amoeba having the life history described by Schaudinn, and that there are at least two pathogenic amoebae—the *Entamoeba histolytica* and *E. tetragena*.

The situation has been admirably summed up by Fantham, who gives his verdict in the following words:

> Recent research strongly suggests that the life cycle of *E. histolytica* described by Schaudinn is inaccurate as regards the exogenous cycle—probably degenerative and associated with minute spores—recorded by him. The correct reproductive cycle of *E. histolytica* seems rather to be the formation of four nucleate cysts, as discovered by Viereck for *E. tetragena*. If *E. histolytica* must stand, its life history would not be that recorded by Schaudinn, but that first described by Viereck, and the species named *tetragena* must then drop. At present, however, it would be presumptuous to dogmatize on such a difficult subject.

Darling states that by feeding young kittens on mucus from dysenteric stools containing cysts of *E. tetragena* symptoms of dysentery are constantly produced; but if, however, no cysts are present, the kittens are not infected, as the adult forms of the entamoebae are destroyed by the gastric juice; apparently the injection into the rectum of dysenteric mucus, even if it contains no cysts but only active amoebae, infects the kittens. The disease runs an acute course, and frequently ends in the death of the animal.

Wenyon, also using kittens, was able to carry the infection through four passages without any apparent loss of virulence; he also found on *post-mortem* examination that the mesenteric glands were invaded by the amoebae, which were seemingly feeding on the gland tissue, and in one case he found four abscesses in the liver, pus from which contained many amoebae. The amoebae obtained from stools of infected kittens were in every way similar to those obtained from the dysenteric stools of infected men.

With regard to the cultivation of the pathogenic amoebae, practically all observers—Craig, Darling, Wells, Wenyon, etc.—are agreed that these protozoa have never been grown on artificial media, those cultures which have been obtained being of a non-pathogenic variety and frequently air-borne.

During the past twelve months several cases of amoebic dysentery have been reported occurring in patients who have never left France. For instance, Paviot and Garin report such a case from Lyons, which they state is the fourth that has come to their notice from this locality, and in searching the literature they find cases have occurred from time to time in France, Germany, and the British Islands. Chauffard, Rouget, Galliard and Brumpt, and Morestin also report such cases from France during the past year. In view of these cases, it appears probable that cases may be occasionally overlooked owing to too great a stress being placed on the fact that the patient has never left Europe.

Legrand collected from the literature 45 cases of abscess of the brain occurring in patients suffering from dysentery. Examination of the pus and sections of the walls of these abscesses had been made in several of these cases and had revealed the presence of numerous amoebae, whereas cultures failed to reveal any bacteria. The situation of the abscess was usually in the cerebrum, the cerebellum being affected only in one case. The symptoms produced by such abscesses were the usual ones of a somewhat acute abscess of the brain. This complication was invariably fatal.

Carini has reported 2 cases in which the wound made for evacuating the pus from a liver abscess became phagedenic; pus taken from the phagedenic areas showed numerous amoebae. Both patients were in a very cachectic condition. Dagorn and Heymann also reported a somewhat similar case in which a small cutaneous abscess appeared in the neighbourhood of the operation wound; on examination of the pus obtained from this abscess numerous amoebae were found.

Treatment.

In June, 1912, and in the following months of that year, Lieutenant-Colonel Rogers, I.M.S., published several papers giving accounts of cases of amoebic dysentery and its complications treated with subcutaneous injections of the soluble salts of emetine. The results obtained by this treatment were very successful, the symptoms of dysentery rapidly disappearing, hepatitis resolving, and even although an abscess had formed in the liver a cure was obtained by simple aspiration when emetine was administered. Such results have been abundantly confirmed by French, English, and American observers, so that we appear to have in emetine a very active specific against the pathogenic amoebae.

Rogers, in his first paper, mentions that Vedder found that cultures of amoebae were rapidly killed by solutions of emetine salts, even in dilutions of 1 in 100,000, and on consulting Vedder's work one finds that several other facts are given which I am mentioning somewhat fully, as Rogers failed to do so.

Vedder, having shown that solutions of fluid extract of ipecacuanha had no specific bactericidal power on dysentery bacilli, then proceeded to investigate if amoebae were affected by this drug. As cultures of pathogenic amoebae are unobtainable, he used cultures isolated from tap water or the stools of a healthy man, and found that fluid extract of ipecacuanha had a very high amoebicidal action which varied markedly with the different extracts used.

Vedder then proceeded to investigate the amoebicidal action of the various constituents of ipecacuanha, and found that emetine even in strengths of 1 in 100,000 sterilized his cultures, and that another alkaloid—*cephaelin*—was equally amoebicidal. Further, he showed that ipecacuanha which had been treated to remove the emetine—the ipecacuanha sine emetina of commerce—had no deleterious effect on the cultures. He then proceeded to investigate the physiological effect of both emetine and cephaelin on dogs, and found that emetine, even in doses of 0.5 grain, had no emetic or depressant action on these animals, cephaelin

however, in doses of 0.1 grain caused violent vomiting and marked depression. He concluded his paper by saying, "If further experiments show that emetine has no marked emetic or depressant action and a constantly high amoebicidal action, we have a drug which may prove as active an agent against amoebic dysentery as quinine is against malaria."

In the past emetine has been given frequently as a substitute for ipecacuanha with markedly good results. The first mention of this was in 1813, when Magendie and Pellitier recommended its use. Lomax Bardsley, in 1829, obtained good results with emetine in some forms of dysentery and chronic diarrhoea. More recently Tull Walsh, in 1891, used a compound of emetine with mercuric iodide with good result in cases of dysentery in India.

That this very effectual remedy passed from the ken of medicine was most probably due to the difficulty of diagnosing the difference between amoebic and bacillary dysentery, but now that Vedder has shown by a series of scientific experiments that emetine is capable of killing amoebae and has no deleterious action on the body, that Rogers had applied the results of these investigations to the treatment of man, and has found a simple method of administering the drug, and that the differential diagnosis between amoebic and bacillary dysentery can be readily and in most easily made, we have a treatment that should be successfully applied to nearly every case of acute and chronic dysentery and those complications which are due to the pathogenic amoebae. Whether this treatment is a radical one, as is claimed by Rogers, can only be solved by time and further careful experiments on animals.

II.—J. Graham Willmore, M.R.C.S., L.R.C.P., and A. Harold Savage, M.B., B.C.Oxon.

(From the Laboratories and Hospitals of the Conseil Sanitaire Maritime et Quarantenaire d'Egypte.)

THE DIAGNOSIS AND TREATMENT OF EPIDEMIC BACILLARY DYSENTERY.

After tracing the history of dysentery in the Eastern and Western hemispheres from the sixteenth century, and showing what a potentiality for evil it exhibited, the authors continued as follows:

In 1910, at the meeting of the British Medical Association in London, a paper was read by Dr. Ruffer and one of us[1] describing the preparation of a multivalent antidysenteric serum, and setting forth the results gained from its trial administration in a preliminary series of cases of epidemic dysentery. Statistical tables were drawn up which showed the decrease of the mortality instant on the introduction of the serum treatment and other minor advantages accruing therefrom. In the present paper we propose to give a short account of this treatment in a further series of 227 cases, in which the presence of bacillary infection—often coincident with amoebic—was demonstrated. In view of the confusion that appears still to exist as to the classification of the different varieties of dysentery, perhaps the most satisfactory, as it is certainly the simplest, is that based on the etiology. We consider it wiser to confine ourselves to this, without attempting a classification on clinical grounds into gangrenous, acute, chronic, etc. By this means the cases are divided into three main groups: (1) Bacillary; (2) amoebic; (3) the combined, in which both types are represented in the same individual. This appears to be all that is necessary as far as the practical issues of treatment and prognosis are concerned.

In 1910 we divided the bacillary cases according to the type of germ or germs which we considered to be responsible for the disease; our diagnosis was based on the data furnished by the isolation of the specific germ or germs from the stools, and by the agglutination reactions of the patients' serum against them and against stock cultures. In some cases the diagnosis was made by both proceedings, in others by one or the other singly. Later experience has convinced us that to attempt further to classify than to prove that bacillary infection of some kind or another is or has been present, is a refinement of analysis, which, while multiplying the difficulties of the technique, not only serves no useful purpose, but may even be a source of positive error. The isolation of any given germ—bacillus A, for instance—from the stools is proof positive that the patient is actually suffering from the effects of that germ, or that he is at best a source of danger to his neighbours. This, however, does not exclude the possibility of other bacilli being present and missed, either from errors in technique or from intermittence in excretion. Further, this procedure is in all instances laborious and often in chronic cases a matter of extreme difficulty. It behoves us, then, to search for some other means of arriving at a positive diagnosis, an end which is, perhaps, the most easily sought by availing ourselves of the various serological tests, especially the agglutination reaction of patients' serum. In the paper read on this subject in 1910 in London it was pointed out that the agglutination test, while most valuable, has serious limitations as a method of diagnosis; the chief disadvantage is the uncertainty as to whether a reaction which is positive for one germ denotes actual or past infection with that germ, and in cases where it is positive for more than one germ, whether these results are to be interpreted as denoting contemporaneous or subsequent infections by those germs. It has been our practice during the last three years to test the serum of every patient against four types of bacilli, in dilutions of 1 in 20 and 1 in 40. In the lower dilution it is the exception rather than the rule to find a serum agglutinating one type of bacillus only, if it agglutinates at all, the agglutination is usually multiple. Table I shows the agglutination reactions of 100 consecutive cases in dilutions of 1 in 20 and 1 in 40.

Table I.

Negative throughout	18
Shiga only	1
Flexner only	16
Tor only	10
87 up (lactose fermenter)	7
Shiga and Flexner	0
Shiga and Tor	6
Shiga and 87 up	2
Flexner and Tor	3
Flexner and 87 up	3
Tor and 87 up	6
Shiga, Flexner and Tor	6
Shiga, Tor and 87 up	4
Flexner, Tor and 87 up	5
Shiga, Tor, Flexner and 87 up	13
	100

An attempt to overcome this was made by heating these multi-agglutinating serums to 56° C. for half an hour before applying the test; by this means we hoped to remove the coagglutinins as recommended by Nègre and Raynaud in the case of *melitensis* and *paramelitensis*, and confirmed by Crendiropoulo. To our disappointment we found that this proceeding, while materially adding to the time required, a matter of no small importance when one has to deal with an epidemic, resulted in a general diminution of the agglutinating power of the serum for all the bacteria equally—that is, it had no eclectic action; this was confirmed by further experiments on agglutinating serums produced artificially by the injection of cultures into animals.

As is well known, the injection of a given germ—*B. coli*, for instance—into one animal may give rise to agglutinins affecting Bacillus A, B, C, D, E, etc. In most instances *B. coli* will be agglutinated in a higher dilution than the others. Unfortunately certain bacilli, particularly those belonging to the mannite fermenting group of dysentery bacilli, cannot be distinguished in this manner, and it then becomes necessary to eliminate the heterologous agglutinins by saturating the serums with their respective bacteria. This procedure gives probably as accurate a result as any serological test, but the time and labour required for its performance obviously put it out of court as a routine in times of epidemic. As to the complement deviation test, Crendiropoulo,[3] working in 1909, found that it was not possible to differentiate between the different dysenteric infections by this method.

Shiga also shows that his serum and that prepared from Flexner's bacillus contained the same sensibilisater, though it must be added that Gryglewicz[4] in Poland and Dopter[5] in France claim to have done so. We are at present conducting further experiments on this point. To resume: Our routine practice for the past years at Tor, therefore, has been to plate out the stools of every case on special differentiating media (either MacConkey or on borated lactose cochineal agar of our own preparation), and at the same time to test the serum of every case for its agglutination reactions against four main types of

dysentery bacilli. The plating of the stools is necessary owing to the fact that agglutinins may not be present in the patient's blood, for two reasons, namely, (*a*) the infection may be of too recent a date; (*b*) the patient's organism may be so completely prostrated as not to respond to the stimulus of the antigen, a condition present particularly in moribund old men.

If, then, a bacillus is isolated from the stools, or if a positive agglutination reaction is obtained for one or more bacilli, we have been in the habit of considering the case as one in which bacillary infection is present, but owing to the "overlapping" of agglutinins as above described, one is not justified in attempting any definite opinion as to the nature of that infection; all that one can say is that the case is one of bacillary dysentery and that treatment by a multivalent serum is indicated. While we are fully aware that this method is open to theoretical criticism, yet we have found it the only practical one in routine work, and it is upon this that we have based our classification in Table II. A point in connexion with the differential diagnosis between gangrenous bacillary and amoebic infections is worth mentioning. These latter show all the symptoms of toxaemia, such as utter prostration, fever, aphonia, cold extremities, collapse, petechial haemorrhages, vomiting, etc., which one is accustomed to associate with severe bacillary infections, and which, in fact, have often led to the cases being sent to the hospital with the provisional diagnosis of cholera. The difficulty is heightened by the fact that the most careful search may fail to reveal any amoebae in the stools, whilst the blood may give a positive agglutination reaction for bacillary dysentery.

This is just the type of case in which, as explained above, the agglutination test fails, in that the positive reaction may be due to either past bacillary infection or present insignificant (that is, benign) bacillary dysentery. Examination of the stools by Schaudinn's method (vital fixation in sublimate alcohol, clearing in iodine alcohol, and staining with iron alum haematoxylin) may throw light on the real nature of the morbid process by revealing the presence of an occasional encysted amoeba or so-called "spore," which cannot be distinguished in the ordinary way. But considerable experience is needed to carry out and interpret this procedure correctly, and in any case Schaudinn's results have been subjected to a good deal of criticism by Hartmann, Hunter, Müller, and others. Failing this, diagnosis must be based on the clinical signs and on the entire failure of the serum to afford any relief. At autopsy reason for the absence of amoebae is given by the presence of an enormously thick, black wash-leather-like slough, which entirely covers the interior of the gut, replacing mucosa, submucosa, and often the entire muscular wall as well. It is only when this is removed or sections of the gut wall made that the amoebae are discovered underneath, infiltrating the subjacent tissues and the neighbouring lymphatics; none are to be found in the gangrenous mass itself.

Table II indicates the classification of cases according to their etiology, with figures from the previous year appended, to show the progressive diminution in the general mortality-rate since the introduction of serum treatment. In addition to the amoebic and bacillary infections, lateral-spined bilharzial ova were found in 12 cases in the stools; in one or two they were the only discoverable cause to which the dysenteric symptoms could be attributed, and the disease was therefore considered to be genuine bilharzial colitis. (These patients were treated, with apparent benefit, with large rectal injections of petroleum lamp oil.)

The *Balantidium coli* was found in 32 cases, of which it was associated with amoebae in 23, and with bacilli only in 9. In no case of genuine dysentery have we ever found it alone, and in view of this and of the fact that we have often found it in the stools of simple (non-dysenteric) diarrhoeics, we are rather sceptical of its claim to be regarded as a cause of genuine dysentery.

TABLE II.

	1907.	1908.	1909.	1910.	1910–1911.	1911–1912.	1912–1913.
Total pilgrims	43,271	29,446	20,333	16,736	25,550	11,880	16,551
,, deaths	423	336	254	113	265	225	88
Per cent. mortality ...	1 (–)	1.14	1.25(–)	0.67	1	1.9 (–)	0.53
Total dysentery admissions	—	155	212	138	328	199	75
Total dysentery deaths...	—	82	134	45	71	139	9
Case per cent. mortality	—	53	63	32.6	21	*(53)(70)	12
Total serum-treated cases	—	0	ϕ 12	91	173	0	54
Deaths among serum cases	—	—	0	15	30	—	7
Case per cent. mortality	—	—	0	16.5	17.3	—	12.9
Cases in which Bacillary Infection only was Present.							
Number of serum-treated	—	—	ϕ 12	72	111	—	22
Deaths among these ...	—	—	0	7	19	—	2
Case mortality per cent.	—	—	0	9.7	17.1	—	9
Number not serum-treated	—	—	196	2	76	—	4
Deaths among such ...	—	—	134	1	20	—	2
Case mortality per cent.	—	—	70 (–)	50	26.3	—	50
Total bacillary cases ...	—	—	208	74	187	—	26
Mixed Amoebic and Bacillary.							
Number serum-treated...	—	—	0	19	62	—	32
Deaths among these ...	—	—	0	8	10	—	5
Case mortality per cent.	—	—	0	42.1	16.1	—	15.6
Number not serum-treated	—	—	4	4	28	—	8
Deaths among these ...	—	—	2	4	6	—	0
Case mortality per cent.	—	—	50	100	21.4	—	0
Total mixed infection ...	—	—	4	23	90	—	40
Amoebic.							
Number of cases ...	—	—	—	41	51	—	4
Deaths	—	—	—	19	16	—	0
Case mortality per cent.	—	—	—	45 (–)	32	—	0
Perforation, general peritonitis, etc.	—	—	—	—	6	—	0
Per cent.	—	—	—	—	12	—	0
Dysentery death-rate (per cent.) compared with total death-rate	—	25	52.8	40	27 (–)	62 (–)	10.26

Parasitic worms—ova or adults—were present in nearly every specimen examined. The commonest were *Ascaris lumbricoides*, taenia, *Trichocephalus trichiurus*, *Rhabdonema intestinale* (embryo), and among Egyptian pilgrims only, *Ankylostoma duodenale*.

The table calls for a word of criticism. In 1908 a large number of cases, recognized as bacillary upon clinical grounds and by the absence of amoebae in the stools—a diagnosis confirmed only too often at autopsy—were treated with monovalent Shiga serum. In spite of the fact that this was given in large doses no improvement was noted in the majority of cases so treated, and the general mortality-rate remained unchanged. That this was due, not to any inherent defect in the serum, apart from its being monovalent, was evidenced by the fact that in the few cases in which the Shiga bacillus was isolated, striking benefit accrued from its administration. Further, we have found that the two monovalent serums (from the Pasteur and Milan Institutes) which we have tested on animals in the laboratory confer a very high degree of protection against Shiga's bacillus or its toxin. *Per contra*, the results of animal experimentation are in complete accordance with our clinical experience at Tor in demonstrating the entire absence of any such antitoxic value for other dysentery bacilli. Cases of infection by Shiga's bacillus are extremely rare at Tor, although they do occur occasionally; this is evidently the explanation of the disappointing results obtained in our early work. We are aware that certain French authorities—notably Vaillard and Dopter—still insist on the efficacy of a monovalent Shiga serum in the treatment of all cases of bacillary dysentery, even when it is due to infection by a member of the mannite-fermenting groups of bacilli; but from all the evidence that we can gather they seem now to stand practically alone in this contention. In 1909 a small quantity of mixed different monovalent serums was tried, purely as an experiment, upon 12 selected cases, all of whom recovered; for that year, therefore, apart from the small number treated, the figures must be excluded from

NOTE.—We have thought it necessary to use as low a dilution as 1 in 20, since were a higher solution only to be used, probably many undoubted cases of bacillary infection would be missed; we have often seen an initially low index rise to a very high one as the case progressed without any serum or vaccine treatment. This is of importance in view of the desirability of (1) giving the serum where indicated; (2) not wasting an expensive drug in conditions of enteritis due to some other agent, such as tubercle or bilharziosis. At a convenient time all the serums that were positive for the lower dilutions were tested up to the limit of their titre.

a comparative review of the situation. The results for 1910 have already been described and discussed in a previous paper. The further series which we propose to analyse may be divided into two groups:

The first between December, 1910. and March, 1911.
The second between the end of November, 1912, and mid-January, 1913.

In the period comprised between the first two dates 432 pilgrims were admitted to the dysentery hospital at El Tor. Of these, 328 turned out to be genuine dysentery, while the other 104 comprised an *olla podrida* of every conceivable illness of which acute diarrhoea is a symptom (from cholera to the abdominal type of malignant tertian malaria). Among these 328 there were 71 deaths, giving a total percentage mortality of 21.

In 1911–12 no serum was available, owing to the fact that the one of us responsible for its preparation was engaged during the summer and autumn of 1911 in cholera work. During this campaign (1911–12) there were 199 admissions for dysentery, with 139 deaths—percentage mortality, 70.

In 1912–13 serum was again available; in this year there were 75 dysentery admissions, with 9 deaths—mortality 12 per cent.

In considering these figures allowance must be made for ths fact that in 1911–12 there were practically no Egyptian pilgrims, while in 1912–13 the Turks, who are most susceptible to the disease, were in great part prevented from making the pilgrimage owing to the Balkan war. Upon comparing, however, the figures for the previous three years, it will be seen that the reduction in the death-rate instant upon the introduction of the serum treatment cannot be entirely fortuitous.

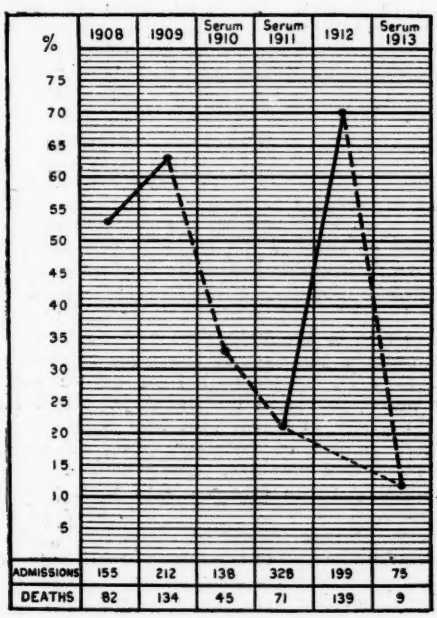

Chart showing dysentery mortality-rate par cent. for the years 1908-13.

TABLE III.—*Mixed Amoebic and Bacillary Cases.*

	Deaths.	Mortality Percentage.
1910:		
19 cases serum treated	8 ...	42.1
4 cases not serum treated	4 ...	100.0
1910–11:		
62 cases serum treated	10 ...	16.1
28 cases not serum treated	6 ...	21.4
1912–13:		
32 cases serum and emetine...	5 ...	15.6
4 cases emetine only	2 ...	50.0
4 cases neither emetine nor serum, as they arrived after the camp was closed.		

In 1912–13 emetine was first used in the treatment of cases where amoebae were shown to be present, whether alone or in conjunction with bacillary infection.

We may, perhaps, quote the following case under the care of Dr. Barthas at Tor as demonstrating the necessity for accurate diagnosis, the specific action of the serum on the bacillary moiety of the disease and its entire absence of any effect on the amoebic moiety.

(Translation from Dr. Barthas's Report.)

Boy, 13 years, admitted December 9th, 1912, with all the symptoms of acute dysentery. Onset four days previously. For the last two days abdominal pain of extreme violence. Reflex anuria. Numerous stools containing blood and mucus in abundance.

9th.—Emergency injection multivalent serum 60 c.cm.

10th.—Condition same, no improvement. Examination of stool showed amoebae in great numbers. (NOTE.—No dysentery bacilli in plates. Blood negative.) ¼ grain emetine in the morning; ⅓ grain emetine in the evening. (This dose, large for an adolescent, was well stood. No vomiting or nausea.)

11th.—Extraordinary improvement. Stools faeculent. No blood. Pain much less. ¼ grain emetine.

12th.—Pain gone. Stools faeculent. ¼ grain emetine.

13th.—Stools formed. Cured.

This brilliant observation has an original and interesting sequel; all went well until December 17th. That day, thanks to the connivance of his neighbours (cases of bacillary dysentery), the boy took from them and ate a large quantity of bread; during the following night he had ten stools with muco-purulent sloughs, violent colic, and prostration.

19th.—Condition same, in spite of ¼ grain of emetine; examination of the stools revealed *no amoebae* but Shiga's and Flexner's bacilli.

21st.—100 c.cm. multivalent serum.

22nd.—General improvement.

23rd and 24th.—40 c.cm. multivalent and 20 c.cm. Milan monovalent Shiga serum—that is, 60 c.cm. each day.

25th.—Marked improvement.

26th.—Marked improvement.

27th.—Formed stools.

A point which impressed one of us (A. H. S.), in charge of the clinical side of the dysentery hospital at El Tor in 1911, was the large number of deaths from nephritis. Many of these occurred in patients who had received massive doses of serum; and we at first thought the serum was not wholly innocent in this connexion, particularly where acute pulmonary oedema was a complication. This opinion was supported by the very appreciable rise which took place in the albumin content (as determined by the Esbach albuminometer) of the urine passed during the twenty-four hours that immediately followed the initial dose of serum, without any attendant diminution in the volume of urine excreted. It may be added that in the (unfortunately) limited number of cases in which it was tried this rise of albumin was observed only in patients suffering from albuminuria antecedent to the first injection of serum; in no case did the serum appear to provoke an albuminuria from previously healthy kidneys. A careful analysis of the autopsy register, however, sufficed to dispel the idea that nephritis was more frequent in serum-treated than in non-serum-treated cases; while the following experiment, repeated in ten individuals, also tended to refute the supposition that a nephritis was harmfully influenced by serum treatment.

Thanks to the kindness of Professor Schmidt, of Kasr-el-Aini, Cairo, we were supplied with serums from two rabbits, which contained precipitins specific for albumins of human and equine origin respectively. Two samples of urine from the same nephritic patient were taken—namely: (1) From the entire quantity passed in the twenty-four hours previous to the first injection of serum; (2) from that passed during the twenty-four hours immediately following it.

These were then filtered through a Berkefeld candle (which may possibly have removed some of the albumin), and we concluded from these experiments that the increased albuminuria after the administration of serum was due to the rapid elimination of the latter, and not to any exacerbation of the existing nephritis.

The clinical routine was as follows:

Immediately on entering the hospital the patient was given a dose of castor and almond oils, and a few cubic centimetres of blood were taken aseptically from the median basilic vein. The stools were examined microscopically and plated out. If amoebae were found to be present emetine was at once given (this last remark applies only to 1912–13). According to the data furnished by the blood reactions and the stool plates appropriate serums were administered. In 1911 multivalent and different monovalent serums were used. In 1912–13 multivalent serum only was employed, with the exception of a few doses of monovalent Shiga serum in cases where Shiga's bacillus was isolated from the stools. In urgent cases stimulants were given, and treatment with multivalent serum and emetine was initiated immediately after the blood was taken without waiting for the results of the laboratory examination. With regard to the quantity of serum

to be injected, later experience tends to confirm the opinion that the best results are obtained from the administration of very large doses—from 80 to 120 c.cm.—injected either deeply into the subcutaneous tissues of the flank and abdomen or intravenously; this procedure is entirely without danger. Moreover, anaphylaxis is less likely to occur after a massive initial dose, followed by decreasing repeat doses, than it is after a small initial dose. Secondly, the cases treated arrived at the hospital saturated with dysentery toxins, which had to be neutralized before the beneficial effect of rest and appropriate diet could be brought into play. In 1913 a comparatively small quantity of the multivalent serum was used, supplied by the Lister Institute, which is recommended to be given in doses of 20 c.cm. Without entering into any discussion as to the relative potency of the Lister serum and the authors', trials of this serum in the dose recommended by the Lister Institute and the dose which we habitually employ led to absolutely parallel conclusions and furnished no less striking a plea in favour of the massive dose. These doses are repeated twice daily or at longer intervals, as the patient's condition demands, during not longer than ten days after the first dose.

It was often noted that the patient exhibited marked improvement for a few hours following the injection, only to relapse when the effect had presumably worn off. Such cases should be injected repeatedly until the improvement becomes permanent. In such a case it may be noticed that whereas at first injections may be necessary every few hours, later, injections may be only required at intervals of some days. Another advantage which, in our opinion, accrues to this method, is that among patients who have thus been thoroughly saturated with the serum, relapses, when convalescence has once definitely set in, are practically unknown—at least we cannot call to mind any such failure. This point is of considerable importance as regards carriers. Dr. Warnock, the Director of the Government Hospital for the Insane at Abbassia, in a private letter to one of us (J. G. W.), states that in asylum epidemics in England practically all "cured" cases later relapse and become carriers. This seems to be his experience also at Abbassia, where cases of dysentery are continually occurring, and are treated with, at the most, one or two injections of 30 c.cm. of multivalent serum. In mild and especially early acute cases, 40 to 60 c.cm. were sufficient; but, unfortunately, such cases at Tor are very rare. The first and most appreciable result of an injection is an improvement in the patient's general constitutional condition, which becomes apparent in a few hours. One or two cases improved so rapidly that, from being apparently moribund on admission, they were able within a few hours to enjoy with impunity a meal, the bounds to which were set by the dictates of prudence rather than by the appetite of the patient. The improvement in the character of the stools takes place much later, and in the chronic and gangrenous cases may not be apparent for many days. The physician should not be discouraged in this event, and especially should not discontinue the treatment, with the idea that it is doing no good. It should be remembered, as numerous autopsies in pre-serum days at Tor only too clearly showed, that in these cases the entire mucosa of the large gut, and often some 3 ft. of the lower end of the ileum, may be the seat of a coagulation necrosis, which has destroyed the superficial layers and replaced them with a bright green or blackish-green diphtheritic false membrane. This dead tissue must be got rid of; as in diphtheria the injection of serum is followed by an improvement in the patient's condition and expulsion of the membrane by coughing, so in bacillary dysentery the passage of sloughs is not incompatible with a critical amelioration of the disease.

Death, when it occurs, is due to poisoning by the absorption of toxins secreted by the bacillus, and never to the local effects of the latter. In contrast to the destruction of tissue seen in amoebic dysentery, in the bacillary variety ulceration is always comparatively superficial, and never gives rise to perforation and peritonitis, or to liver abscess.

For the above reasons the strict limitation of diet necessary in amoebic dysentery is inadvisable, while particular attention should be paid to the heart, lungs, and kidneys.

Prophylaxis consists in free administrations of serum and stimulants, discouraging a dorsal decubitus, and the most scrupulous attention to securing an aseptic condition of the mouth. Once bronchopneumonia is well established no treatment seems to have the least effect in averting a fatal issue; it is mere waste to inject serum.

It occasionally happens, after the patients have recovered under serum treatment from all immediate danger, that convalescence is retarded by an intermittent diarrhoea, with or without mucus and mucopus, which serum appears to be unable completely and permanently to control. If such a case come to autopsy, be it for dysentery or intercurrent disease, the large intestine is often found entirely denuded of its mucosa and of a bright red colour, showing where the false membrane above mentioned has sloughed away leaving what is practically a large granulating wound, on which are small patches showing all stages of the morbid process. The condition is very similar to that seen in large superficial burns of the skin. It is obvious that this surface not only is functionless, but is in any case extremely irritable and an excellent door for the entrance of secondary infecting bacteria. No one in his senses would expect a granulating wound of the skin of such superficies to heal up in a few days, even though it be kept comparatively aseptic. How, then, can a similar wound in the intestine, continually bathed in septic material, be expected to heal more rapidly?

Treatment in these cases must aim, obviously, at supporting the patient's strength, securing as aseptic a condition as possible of the intestinal contents, and giving the inflamed bowel as much rest as possible. As regards treatment by medical means, it may be laid down as an axiom that the fewer drugs that are given the better. It is conceivable that this class of case would offer a fair field for vaccine-therapy, and, in fact, we tried it in 1910 with apparent success; our experience was limited, however, to one or two very obstinate cases convalescing from gangrenous bacillary dysentery (*B. tor* isolated), one who ultimately recovered completely. We did not give it a more extended trial, as our multivalent serum was on probation, and we did not wish to obscure the main issue by introducing elements of polytherapy. Reliance at present must be placed, therefore, essentially on an appropriate dietary, which should be appetizing and combine a maximum of concentrated easily digested nourishment with a minimum of residue. Milk fulfils none of these desiderata; it is bulky, most patients loathe it after a certain time, it leaves a hard massive residue of undigested casein. Citrated milk is, in our experience, little better, whilst most of our patients flatly refused to take it. Yaghûrt, on the other hand, was always taken with the greatest avidity, being in one form or another the staple diet of many Oriental peoples; while examination of the stools showed it not to be completely digested, it had an undoubted effect in arresting the putrefaction of the intestinal contents, and never gave rise to the meteorism and colics which were so often seen in the days of the plain milk diet. The yaghûrt may be supplemented in severe cases with albumin water, expressed raw meat juice and lean raw meat pulp given in warm (not hot) soup or beef-tea; later thick purées of potatoes, peas, or lentils, well strained gruel and porridge, lightly cooked chicken and fish, preferably made into a cream with potato purée, light omelettes, soft white cheese, etc., may be added to the dietary. Sugar should be given freely, and is conveniently administered in the form of malted milk. Feeds should be given often, and only a small quantity allowed at a time; nothing very hot or very cold should be allowed. Stimulants should be given freely when their use is absolutely indicated, but alcohol in any form is to be avoided as much as possible. As far as local treatment is concerned, lavage with any solution stronger than physiological saline or linseed tea is, in our opinion, to be condemned. We particularly dislike the much vaunted injections of silver nitrate. In any case, we use lavage, as a rule, only in cases of post-dysenteric constipation.

NOTE.—Yaghûrt must be prepared with the greatest care. It has been our practice to buy in Suez at the commencement of the pilgrimage season several samples of Leben Zibad and to inoculate them into sterilized milk. That which gave the softest and most homogeneous curd was then plated out on MacConkey or lactose cochineal agar, and pure cultures obtained of a large lactic acid producing bacillus and a long streptococcus (? *S. lebensis*). These were then inoculated into sterilized milk ("Natura" brand)—the Australian condensed milk is unsuitable—and each batch of yaghûrt, prepared in covered sterilized jars in an incubator at 37° C., was inoculated with a flamed spoon from the preceding one. The curdled milk prepared from the various so-called lactic acid tablets on the market should, in our opinion, never be used.

REFERENCES.
[1] Ruffer and Willmore, BRITISH MEDICAL JOURNAL, November 12th, 1910. [2] Crendiropoulo, *Archives de méd. expérimentale*, Tome xxiv, No. 6, November, 1912; Négre et Raynaud, *Compt. rend. de la Soc. de Biologie*, Séance du 18 Mai, 1912. [3] Ruffer and Willmore, BRITISH MEDICAL JOURNAL, September 25th, 1909. [4] S. Gryglewicz, *Ann. de l'Inst. Pasteur*, xxvi. [5] Vaillard and Dopter, *Ann. de l'Inst. Pasteur*, xxi.

III.—C. M. WENYON, M.B.Lond.,
Protozoologist, London School of Tropical Medicine.

THE MORPHOLOGY OF THE INTESTINAL AMOEBAE OF MAN.

THE clear separation of the various amoebae and entamoebae from one another is one of the most difficult problems facing the protozoologist who is interested in human pathology. I venture to think, from a considerable experience of these organisms, that until some satisfactory method of cultivating them has been discovered it will be impossible at times to distinguish between these various entamoebae.

It is well known, in the case of free living fresh-water amoebae, that it is possible, by the simple procedure of altering the quality of the water, to produce marked changes in any individual amoeba. Accordingly it is to be expected that the characters of the entamoebae inhabiting the human intestine will vary with the alterations in quality of the intestinal contents, which change considerably from time to time in density, alkalinity, composition, etc. A failure to recognize this fact has been partly responsible for the creation of numerous species of entamoebae from the human intestine.

Another factor which has had a similar result has been the assumption that the entamoebae should be uniform in appearance at every stage of their life-history. Quite recently Darling has drawn attention to the fact that the pathogenic entamoeba of man passes through a life-cycle in which an active multiplication stage alternates with a stage of encystment, and that as encystment approaches the entamoeba gradually assumes a type which may be very different from that of the actively multiplying entamoeba; so much so that the encysting forms have been supposed by Elmassian to represent a distinct species and have been called by him *Entamoeba minuta*. It cannot be too strongly emphasized that the creation of new species of entamoebae from single cases is full of the utmost danger and is bound to lead to further confusion.

A third point which has not been sufficiently recognized is that many of the entamoebae escaping from a human intestine are in a degenerative condition or are actually dead. A failure to appreciate this, according to Hartmann, led Schaudinn into the extraordinary error of regarding the degenerating forms of the pathogenic entamoebae as belonging to a species distinct from others which were not degenerating in the same preparations. Another illustration of this type of error is the *Entamoeba undulans* described by Castellani. If one examines fresh preparations of *Trichomonas* from the human intestine it will be noted that after a while many of the flagellates undergo a peculiar change whereby the three anterior flagella disappear, and the large one attached to the border of the undulating membrane first detaches from the membrane and is finally cast off completely, so that one has left merely a mass of protoplasm which performs amoeboid movements. These movements are often very peculiar, for a long finger-like pseudopodium is thrust forth, and this passes in a kind of wave-like manner down the side of the body till it finally disappears at the opposite end. Another is then produced, and it behaves in a like manner. These pseudopodia are produced in rapid succession every few seconds or more slowly. Again, the whole margin of the now amoeboid organism may move as an undulating membrane. This margin is most probably the remains of the retracted undulating membrane from which the flagellum has become detached.

The description given by Castellani of his *Entamoeba undulans* is a very good one if applied to these altered *Trichomonas;* and to any one who is well acquainted with the behaviour of *Trichomonas* outside the body there cannot be any doubt that he was dealing with this flagellate and not with an entamoeba at all, especially as no evidence was produced to exclude the possibility of the so-called *Entamoeba undulans* having been derived from flagellates which were present in the faeces at the same time.

It would thus appear that the greatest caution is necessary, in the present state of our knowledge, in deciding whether any entamoeba showing some morphological peculiarity is or is not a new species. Two fairly well-defined types of entamoebae are now known. One is the pathogenic entamoeba, known variously as *E. histolytica*, *E. tetragena*, etc. In typical cases of dysentery, in which the stools are small, consisting of blood, mucus, sloughs, and comparatively little faecal matter, the majority of the entamoebae usually are of a fairly definite type. There is the clear ectoplasmic layer enclosing the more liquid endoplasm in which the comparatively small nucleus and food vacuoles lie. Very frequently red blood corpuscles are enclosed. The nucleus in the living entamoeba may be clearly visible or may be seen with difficulty. In the latter case the failure to detect the nucleus may be the result of its having broken up after the entamoebae have left the body; in other cases it is due to a poverty of refractile chromatin granules. In well-fixed and stained specimens the same distinction of ectoplasm and endoplasm can be made out, and more details of the nuclear structure distinguished. There is a definite nuclear membrane, upon the inner surface of which chromatin granules are arranged. These granules are generally small and fairly uniform in size, but occasionally they become massed together into several larger and more irregular clumps. The nuclear membrane is continued within the nucleus as the linin network of fibres upon which some very fine granules are seen. At the centre of the nucleus a granule can usually be distinguished, and surrounding this a clear area limited by a ring of granules, which represents the inner limit of the linin network.

According to Hartmann the central granule of the nucleus represents a karyosome with centriole and a kind of cyclic growth takes place whereby the granule consisting of little else than the centriole increases in size by the deposit of chromatin material round it till the whole or nearly the whole of the clear area is filled up to the ring of granules. A decrease in size then takes place by the passage of the chromatin into the outer parts of the nucleus till finally the clear area is formed again and the centriole alone occupies its centre. I have not actually followed this process, but in stained specimens the size of the central granule varies considerably. When the central granule or karyosome is large it is by no means always possible to distinguish a centriole within it, and that one is always present is more of an assumption than anything else and is largely dependent upon the view that this centriole represents the centrosome which must necessarily be present for purposes of nuclear division.

The type of nucleus just described is that which is usually seen in the entamoebae from cases of amoebic dysentery. On the other hand many of the entamoebae in the preparations will be found to have nuclei of different types, but in which one or other of the features of the typical nucleus is shown. Thus in some no central granule or karyosome will be seen and the whole of the interior of the nucleus appears to be made up of a uniform linin network; in other cases the central clear area will be shown, but no granule within it. The thickness and distinctness of the nuclear membrane varies very much, so much so that at times it may be extremely difficult to be sure that a membrane is present. It may be that sometimes it is absent. The amount of chromatin upon the inner surface of the membrane varies also. On some occasions one or more large masses are present and these appear to represent the whole of the chromatin stock of the nucleus —at other times there may be only a few small granules so that the nucleus is very poor in chromatin material.

It would be quite illogical to suggest that such differences correspond to different species of entamoebae, and it seems to me that such a test as the distinctness or indistinctness of a nucleus as a guide to a differentiation of the entamoebae is quite inadequate. Not only is the nucleus of the entamoeba subject to wide variations, but the cytoplasm is equally variable. As explained above, the typical entamoeba, as seen in dysenteric dejecta, has a distinct ectoplasm, but this is not shown uniformly by all the entamoebae, for in many of them there is no clear distinction between these two layers, and further, those forms of the entamoebae which are about to become encysted again have no very definite ectoplasm. The pre-encysting forms, further, may have the cytoplasm charged

with chromidium, which occurs in the form of small round masses, rods often of a spindle shape, or irregular clumps. Chromidium in one form or another is often seen in the cytoplasm of degenerating entamoebae.

If we turn now to the non-pathogenic *Entamoeba coli* we find an entamoeba with a much vacuolated cytoplasm, having little or no tendency to separation into ectoplasm or endoplasm, as in the typical pathogenic form. The nucleus, which is usually larger in proportion to the size of the entamoeba than in the *Entamoeba histolytica*, has a definite nuclear membrane which, in my experience, is not necessarily thicker than that of the pathogenic entamoeba. The chromatin is arranged as coarse irregular granules upon the inner surface of the membrane, and there is a linin network which usually extends right up to the karyosome occupying the centre of the nucleus. This karyosome is sometimes comparatively large, having a diameter equal or greater than half that of the entire nucleus. At other times it is smaller, and occasionally a clear area surrounds the karyosome, as is the case with the nucleus of the pathogenic entamoeba.

Entamoeba coli, or what is presumably this entamoeba, occurring in the healthy intestine, may sometimes have a very definite ectoplasm and simulate very closely indeed the typical pathogenic form. In such cases, are we to assume that we are dealing with a mixed infection of the pathogenic and non-pathogenic entamoebae in the healthy intestine? Till we know more about the appearances of the pathogenic entamoebae in the healthy gut, and of the non-pathogenic entamoebae in the ulcerated dysenteric intestine, it will be impossible to answer this question with any degree of certainty.

The encysted forms of the entamoebae are more readily differentiated than the free entamoebae themselves. The *Entamoeba coli* has a cyst, most usually, though not invariably, spherical, and having a diameter of about 15 μ. Within the transparent cyst there is a single mass of protoplasm, containing one, two, four or eight nuclei, according to its stage of development. In actual examination of faeces the overwhelming majority of cysts have eight nuclei, and are readily recognized as the cysts of *Entamoeba coli*. These cysts, however, are again subject to many variations. The commonest is the occurrence within the cytoplasm of a large vacuole, which may be of such a size that it pushes the nucleus right against the cyst wall. This nuclear displacement appears to retard nuclear division, for cysts with a large vacuole rarely have more than two nuclei—the division into four, though it may occur, and then into eight, seems to be prevented in some mechanical way by the hampering effect of the large vacuole. What is the ultimate fate of such a cyst is not known. Again, the cysts, instead of being spherical, may be distorted, and even elongate structures with the length of one diameter twice that of the other. The surface of the cyst may be crinkled and creased so that at first sight in stained specimens one may have the impression that one is dealing with an irregularly shaped unencysted entamoeba containing eight nuclei, and conclude that it is an instance of schizogony, which is supposed by some to occur in this entamoeba. Another and important variation is that of the size of the cyst. The usual diameter is about 15 μ, with slight variations above and below this limit. Very rarely I have come across cases in which a rapid encystment of the entamoebae is going on, with the result that cysts of all sizes are produced, from large ones fully 18 μ in diameter down to small ones about 9 μ. These small cysts may contain one, two, four or eight nuclei, as the large ones, but usually the nuclear multiplication ceases at four. In such cases it may be impossible to distinguish some of these smaller cysts from those of the pathogenic entamoebae which have a maximum of four nuclei and are generally smaller than the cysts of the non-pathogenic entamoebae. It might be urged that in these cases I was dealing with a mixed infection, but a study of the preparations and the various gradations in the sizes of the cysts shows such a view to be improbable.

The pathogenic entamoebae become encysted in cysts which have a diameter of about 10 to 12 μ. Within each cyst is usually a single mass of protoplasm containing four nuclei. Sometimes a medium-sized vacuole occurs in the protoplasm and one or two deeply staining rods, which are generally termed chromidial bodies, which have been formed by an aggregation of the chromidium granules of the encysting entamoeba. In my experience the cysts of the pathogenic entamoebae are not subjected to the same extent of variation as are the cysts of the non-pathogenic forms. In other words, the pathogenic cyst is more constant in appearance. On the other hand, I know of no method by which it would be possible to distinguish one of the smaller cysts of *Entamoeba coli* from a cyst of the pathogenic entamoeba. Fortunately, these abnormally small forms of the cysts of *Entamoeba coli* are of rare occurrence, so that, as a rule, there is little difficulty in distinguishing the cysts of the two entamoebae.

I have refrained from mentioning any of the other entamoebae which have been described from the human intestine for the reason that I do not consider they have been sufficiently studied to justify their recognition as distinct species. From time to time, however, I have found in the human intestine amoeboid organisms which differ very markedly from the usual entamoebae. These are mostly very small amoebae, having a diameter of 3 to 10 μ. They have a cytoplasm with no marked ectoplasm, and a nucleus which is of the type of that of the free-living non-pathogenic *Amoeba limax*. There is a nuclear membrane upon which there is no chromatin, while the centre of the nucleus is occupied by a large karyosome, holding apparently all the chromatin of the nucleus. Are these small amoebae necessarily distinct from the entamoebae? I have noted in some cases of large infections of what is undoubtedly *Entamoeba coli* every gradation in size of the entamoebae, from forms with a diameter of 20 to 25 μ down to minute organisms of a diameter of 5 μ or even less. A further noticeable feature is that some of the smallest forms show the typical *Amoeba limax* nucleus. Here, again, there is a difficulty, for if the small forms with the *limax* nucleus are in reality *Entamoeba coli*, then in those cases in which one finds large numbers of small amoebae all having this type of nucleus one may still be dealing with a stage in the life-history of *Entamoeba coli*, and not with a distinct amoeba. Such problems cannot be settled by the mere examination of stained preparations nor by inoculation experiments with possible mixed infections, and they probably will not be settled till some method has been devised by which pure cultures of these intestinal entamoebae can be maintained for study, and used for infecting animals. In this paper I have done little to clear up the confusion surrounding this important group of protozoa, but simply indicated some of the difficulties which I myself have encountered in attempts to follow out their histories and separate them from one another.

DISCUSSION.

Major W. S. HARRISON, R.A.M.C., said: By far the most frequent form of dysentery in the army in peace time is amoebic dysentery, though we do get some cases of one of the bacillary forms. I propose to deal only with the diagnosis and treatment of amoebic dysentery. This causes not only florid dysentery in the popular acceptation of the term, but also a very large proportion of the chronic tropical diarrhoeas. Quite a number of patients with amoebic dysentery never have had an acute attack with the appearance of bloody mucus in the stools, but in all one gets some history of irregularity of the bowels with griping at times. The irregularity may consist in occasional attacks of diarrhoea with intervals of constipation, or the patient may never pass a solid stool; profuse watery stools are, however, unusual as a regular feature. In most of the cases, even when the patient denies that he has passed bloody mucus, one can find it on examination. One can usually find a tender spot somewhere along the colon, the most frequent places being the caecum, the sigmoid, and the region of the two flexures, and in a thin subject it is often possible to determine that there is some thickening of the colon over these areas. Those patients whose disease is located in the neighbourhood of the caecum run serious risks of having their appendix removed if they get into the hands of a surgeon who is not familiar with tropical disease, and even sometimes when he is.

If the history and symptoms point to amoebic dysentery it is not necessary or desirable to wait until amoebae are

found in the stool before making a diagnosis. Amoebae are often very difficult to find in chronic cases, although the effect of treatment is to show that they were probably present; in acute cases they are easily enough discovered, there is nothing easier in medicine.

My present routine is to examine the freshly passed stool for amoebae and also to make cultures from it. If the culture does not show the presence of one of the dysentery bacilli and the history and symptoms are sufficient, I assume that amoebic infection is possibly present, and I commence giving emetine in doses of ¼ to ½ grain daily. In addition I irrigate the bowel with saline, followed by saline containing quinine. The effect of emetine on amoebic cases is nothing short of marvellous; frequently patients will tell one that after the very first dose they lost the incessant discomfort in the belly from which they had suffered for months or even years. In liver abscess emetine is of the greatest value, many cases which one might confidently say had gone on to pus formation subside under the influence of the drug. I see no reason why, when abscesses are small, they should not be absorbed; once one has destroyed the only living organism in them they are so much sterile material. When the abscess has been opened the effect of emetine or ipecacuanha is again very striking, especially in cases where the patient is pouring out pus in floods and is visibly wasting day by day. A few doses of ipecacuanha or emetine under these conditions usually reduces the quantity of discharge so rapidly that one might be tempted to think that there was a block in the drainage.

I usually keep up the use of emetine for ten days, then go on with ipecacuanha for two weeks, giving it in 20-grain doses daily; the preliminary treatment with emetine seems to produce a tolerance for ipecacuanha, and one rarely then gets vomiting even when the drug is given as an uncoated bolus. Whilst the bowel is being irrigated, and emetine or ipecacuanha given, the symptoms of dysentery are often in abeyance, and one may feel some doubt as to whether the patient is really improving. A sign to which I attach the greatest importance is gain in weight; a cachectic dysentery case who is recovering will gain weight at something like a pound a day. I have seen very few cases of amoebic dysentery which did not respond to the use of ipecacuanha or emetine. Some very old cases take time, and they occasionally relapse several times in the course of the treatment, the relapse being foretold by a slight rise of temperature and by an increase in abdominal discomfort. Where there is no response at all to treatment, or where, in spite of keeping the bowel symptoms in abeyance, the patient continues to waste, one may feel fairly confident that the large gut will be found to be severely contracted at the *post-mortem* examination.

With regard to Captain Douglas's paper, I have seen one case of phagedaenic ulceration round an appendicostomy wound with amoebae in the pus. The preparations of emetine vary a good deal in the amount of local irritation which they produce; emetine, according to personal experience, is rather stimulating than otherwise in its general effects.

With regard to the paper of Drs. Willmore and Savage, it is often assumed that practically all bacillary dysentery is due to either Shiga or Flexner bacilli. I have, however, come across cases of bacillary dysentery due to other germs, in one case to *paratyphosus* B; this was a fatal case with great ulceration of the big gut. Two cases with frequent acute relapses were apparently due to Morgan's bacillus, and one to a germ which at first resembled Morgan's bacillus but later took on the power of slowly fermenting lactose.

Lieutenant-Colonel Molesworth, I.M.S., stated that in the Madras General Hospital emetine hydrochloride had been used with very great success in the treatment of cases of amoebic dysentery, both acute and chronic. The usual dose was from ⅛ to ⅓ grain, up to nine injections during a week. The vast majority of all the cases was the amoebic form; bacillary dysentery was rarely seen. In liver abscess also the use of emetine chloride, either subcutaneously or orally, had met with success, especially given previous to operation. It most certainly reduced the patient's temperature, improved the cachexia, and gave the patient a better chance in the subsequent surgical procedure.

Lieutenant-Colonel A. Leahy, I.M.S. (ret.), said: More than twenty years ago I had the opportunity of treating over 100 cases of acute dysentery by the administration of a saturated solution of magnesium sulphate. This method of treating the disease was first brought to my notice by a short article in an American work on therapeutics, written, I believe, by Professor Wood. The results of my treatment of these cases of acute dysentery were very gratifying, and were embodied in a paper published in the *Lancet* in 1890. I then believed, and laid it down as a rule, that this method of treatment was only applicable to acute cases. However, time and the experience of others have proved that this method of treatment is also useful in certain chronic cases. I regret I was unable to be present when Captain Douglas read his valuable paper to-day. The second point on which I should like to say a few words is the intimate connexion which exists between dysentery and liver abscess as cause and effect. I have always thought that all cases of single liver abscess are invariably preceded by an attack of dysentery, that in all probability such abscesses are infective in their origin, and never occur without a previous attack of dysentery. One case remains particularly clear in my memory, and I think it illustrates this well. [All the cases I treated in 1890 on careful inquiry elicited a history of a previous attack of dysentery.] A young man, aged 27, had an attack of acute dysentery for which he was treated by his physician in Calcutta. He rapidly got well, and all bowel symptoms passed away. He was sent to Darjeeling. After he had been there a few days his temperature began to rise, and he suffered from malaise. There were no bowel symptoms, and he returned to Calcutta at the end of the week. There he consulted me. I found he had a daily rise of temperature. It began to go up about 2 or 3 p.m., and reached 101°, remaining up until 7 p.m., when it subsided. His tongue was foul, but he had no pain, no rigors, no symptoms whatever pointing to implication of the liver, and his bowels were quite normal. He was put on quinine, and I saw him daily for a week, during which his condition remained the same. One evening I was summoned and found him complaining of intense pain over the region of the liver. This was the only symptom he had. There was no tenderness, no swelling, and no rigors. However, three days later he had a rigor, and I found some slight oedema of the skin over the epigastrium. Chloroform was given, and I explored the liver with an aspirating needle. Typical liver pus was found and evacuated into the bottle of the aspirator. This bottle had been previously carefully sterilized, and the contents were sealed up in it and sent to the professor of bacteriology, who examined them and reported the pus to be that from a liver abscess, and crowded with amoebae. Two days later I cut into the abscess, treated it in the usual way, and at the end of the month the young man went to Europe cured. This was more than twenty years ago, and I met him the other day in the City quite well. I submit the history of this case shows the connexion between a previous attack of dysentery and the subsequent formation of an abscess. I think this illustrates cause and effect. It is not difficult to imagine the ulceration of the mucous membrane, the closing of the blood vessels by thrombosis, and the passage along blood clots and lymphatics of such motile bodies as the *Amoeba coli*. Once in the substance of the liver they infect it, and you have all the conditions favourable to the formation of an abscess.

Colonel Sir William Leishman thought the Section had every reason to congratulate itself on having had an interesting and profitable discussion. The papers of Captain Douglas, of Drs. Savage and Willmore, and of Dr. Wenyon had covered a wide field, and had shown in striking form how great progress had been made of late in the study and in the treatment of dysentery. It had also, to his mind, furnished yet another example of the great importance of early and accurate diagnosis, in order that the treatment appropriate to the amoebic or bacillary type of the disease might be commenced without delay. The results which Drs. Savage and Willmore had shown of the treatment of the bacillary form with a multivalent serum appeared to him very striking, and had done something to raise serum-therapy from the disfavour it had of late fallen into; at the same time, he hoped further work in vaccine treatment would be undertaken.

DISCUSSION ON THE CAUSES OF INVALIDING FROM THE TROPICS.

OPENING PAPERS.

I.—G. BASIL PRICE, M.D.Lond., M.R.C.P., D.P.H.

IN discussing the causes of invaliding amongst those resident in tropical and subtropical regions considerable variation may be expected to occur both in different countries and amongst different classes of European residents.

I. Some factors relating to health and disease are fairly constant for each country and season, such as: Average temperature and thermic influence; humidity of atmosphere; elevation of different districts; the persistence of endemic disease, prevalence of mosquitos and malaria during certain seasons; the insanitary conditions associated with Eastern and primitive life; the prevalence of infective disease such as tuberculosis and malaria amongst native populations.

II. Other factors influencing the health of Europeans of necessity vary greatly, such as:

1. *The location of the individual*, whether living in centres of modern commercial life such as Calcutta, Madras, Shanghai, Hong Kong, etc., where the conditions of life closely approximate those of Europe, or living amongst primitive peoples on the outskirts of civilization, working amongst races not yet emerged from the slough of ignorance on health matters. This condition of ignorance means impotence to check, toleration and indifference to the presence of disease, often accompanied by direct antagonism to measures calculated to meet such need. It is therefore difficult, if not impossible, to circumscribe and check those causes of suffering and death which at times produce such fearful mortality.

2. *The habits of the individual*, particularly with reference to the adoption and practice of the usual well known safeguards to health, to the taking of sufficient exercise, to the use of a suitable dietary, and avoidance of the abuse of alcohol.

3. *The individual idiosyncrasy*, under the heading of which I place temperament, liability to catch disease, reaction to humidity, high average temperatures, thermic influences. The possession of mental equilibrium and stability and of common-sense are essential qualities for life in the tropics, and are individual factors which are impossible to gauge with accuracy in candidates for foreign work and residence. Therein lies one of the difficulties in eliminating the possible "failures," since no indication of such weakness may be indicated whilst resident in the homelands, either by a consideration of the family or personal history or physical state. It is impossible to apply similar tests and conditions as will be encountered in tropical and subtropical residence.

The section of European residents with which I have been asked to deal is the missionary section, and before suggesting any conclusions I desire to give some of the evidence on which my views are based.

During the last few years I have been collecting such statistics as are available with regard to missionary lives; and, under the authorization of the Association of Medical Officers of Missionary Societies, of which I was the honorary secretary, about 2,000 printed forms were issued to English missionaries in all parts of the world to try and gather evidence on the causes of invaliding, retirement, and death. I am very grateful to the minority who returned these forms, and particularly to the many medical missionaries who in the midst of their busy and arduous lives kindly contributed valuable details. The salient facts, mainly of a reliable character, were thus given on some hundreds of lives, covering the years 1890-1908.

The Church Missionary Society, through its medical advisers, Dr. Charles F. Harford and Dr. Leopold Hill, very kindly placed at my disposal all their valuable medical statistics, which have been carefully recorded and systematically collected for many years. My grateful acknowledgements are due not only to these gentlemen, but also to Dr. Andrew Jukes, Dr. Hulme Griffith, and Miss Eva Morton, for their labours in reducing the mass of all these statistical records to a less bulky form, which was capable of being assimilated into and affording facts for this paper.

A total of 1,479 lives are dealt with, of which 1,051 are obtained from the Church Missionary Society records, and are therefore reliable and due to systematic collection by the society's medical examiners.

Causes of invaliding in 428 lives were collected by my forms of inquiry. The causes of death based on these same records have been already dealt with by me in a paper read before the Association of Medical Officers.

The total of 1,479 lives were distributed as follows:

TABLE I.

	Total Lives.	Men.	Women.
India	533	245	288
Ceylon...	65	32	33
China	394	162	232
Japan	105	29	76
Africa—			
North, Algeria	20	12	8
Egypt, Palestine, Arabia	71	19	52
West, and Nigeria	65	34	31
Central and East, and Uganda ...	152	79	73
South	31	25	6
Madagascar	14	5	9
Persia	29	10	19
Total	1,479	652	827

I had also some returns from Spain, West Indies, Central America, South America, Labrador and Northern Canada, New Guinea, Samoa, but the numbers were too small to be worth analysis. Analysing the causes of invaliding in the case of the lives included in Table I the following facts emerge:

India.

The Church Missionary Society lives number 379 (188 men, 191 women), of whom 93 were invalided, or 24.5 per cent. Among the other societies 154 were invalided (57 men, 97 women). Altogether, therefore, there were 247 cases of invaliding, which in 203 were due to the following causes:

TABLE II.

	Per Cent.	
Nervous conditions of a neurasthenic type ...	20.6	25.4
Mental disorder of acute type	4.8	
Enteric fever	16.6	
Malaria	13.3	
Dysentery	6.4	
General debility	4.8	
Pulmonary tuberculosis	3.2	
Cardiac disease	3.2	
Anaemia	3.2	
Small-pox	1.6	
Gall stones	1.2	
Eye conditions	1.2	
Blackwater fever	0.8	

The remaining 44 cases were isolated cases having no particular bearing on life in the tropics.

The prominence of "nerve strain" and neurasthenic conditions is worth noting, and whilst this was the terminating phase before invaliding, it must be remembered that illness—chiefly malaria or bowel disorder of a comparatively light character—had occurred in probably many of these previously, and were factors in inducing both this condition and others, such as general debility, anaemia, and functional cardiac conditions. This question of "nerve strain," occurring as it does in connexion with work in other countries, will be commented on as a whole.

Ceylon.

The Church Missionary Society contributed 56 lives, of whom 3, or 5.3 per cent., all men, were invalided. Other societies contributed 9 lives invalided (7 men, 2 women), making a total of 12 (10 men, 2 women). Among these, nervous breakdown accounted for 5, malaria

for 2, enteric for 1, and dysentery for 1, and appendicitis, diabetes, and throat trouble for the others. The numbers are too few to analyse further. It would appear that Ceylon was a healthy locality.

China.

In this country the missionary lives numbered 394 (162 men and 232 women), and supplied 203 cases of invaliding, which are analysed in Table III.

TABLE III.—*China.*

Causes.	North (58 cases).	Central and West (79 cases).	South (66 cases).	Total (203 cases).
	Per Cent.	Per Cent.	Per Cent.	Per Cent.
Neurasthenia	44.8	17.7	16.6	25.0
Insanity	5.1	12.6	7.5	8.8
Enteric and paratyphoid	13.8	7.6	7.5	9.8
Malaria	8.6	11.4	15.0	11.8
Dysentery	5.1	7.6	3.0	5.9
Tubercle, pulmonary ...	5.1	8.8	18.0	10.8
Typhus	—	5.0	—	1.9
Sprue	—	2.5	4.5	2.9
Small-pox	—	3.8	—	1.4
Anaemia	—	—	3.0	0.9

It is interesting to note the decidedly larger proportion of "nerve" cases which occurred in North China; perhaps some cause for this may be found in the drier atmosphere and also long periods of monotonous sunshine, which tends to promote at first increased mental and physical activity, but afterwards leads on to nervous irritability—a condition often hastened or exaggerated in many cases by the long-continued political unrest in that country, with the frequent reign of mob law and scenes of violence. Insanity, characterized by mania, religious delusions, or melancholia, has unhappily occurred in all parts of China, but is most marked in Central China according to these figures. Tuberculosis, pulmonary in all but two cases, comes third on the list of most prevalent causes for invaliding, the usual cause being contact with infected cases; this disease will again be referred to. Enteric fever produces nearly 10 per cent. of cases. Paratyphoid was reported in 2 cases. From remarks made as to suspected cases of enteric abroad, it is an interesting problem whether strains of typhoid germs do not differ in various parts of the world; and, if this is the case, whether local strains would not better be used for antityphoid inoculation when landing in a country rather than be given in the homeland. One case of sprue was reported from North China, where it is generally considered non-existent, but the boundary between North and Mid China is a somewhat vague one. Malaria is decidedly more prevalent in South China and Central China, and comes second in order of importance as to invaliding.

Japan.

In this country, whilst the general conditions for health seem good, "neurasthenia" is even more prominent as a cause for invaliding than in China. The Church Missionary Society gives records of 105 lives. Of these 17, or 16.1 per cent., were invalided (6 men and 11 women), and of this number 14 were due to neurasthenic conditions—that is 81.25 per cent. The other causes were: 2 apoplexy and 2 from gynaecological conditions. Of course the numbers are too small to base any general statement on them, but they are interesting as far as they go. It has been suggested that the inhalation of monoxide fumes from charcoal stoves in the Japanese houses may partly contribute to the nerve and head symptoms met with in missionaries, but also the constant occurrence of earthquakes and electrical disturbances are contributory factors in nerve conditions.

Africa.

Africa has been divided up into North, with which I have included Algeria, Egypt, Palestine, and Arabia; West, including Nigeria; Central and East, with Uganda; South. The figures are unfortunately small, but enteric fever is present as a definite cause in North and South, absent in Central and West Africa. Malaria is the cause of 75 per cent. of invalidings in West Africa, blackwater fever and malaria 40.4 per cent. in Central Africa, where also occur isolated cases of tick fever and sleeping sickness. Neurasthenia again is prominent as a cause in North, Central, and South Africa. Old age is given as a cause in 25.8 per cent. in South Africa. The total number invalided was 134 (79 men, 55 women). The causes of invaliding are analysed in Table IV.

TABLE IV.—*Africa.*

Causes.	North (39 cases).	West (12 cases).	Central (52 cases)	South (31 cases).	Totals (134 cases).	
	Per Cent.	Per Cent.	Per Cent.	Per Cent.	Per Cent.	
Neurasthenia ...	23.0	8.3	21.1	22.5	20.8	
Malaria	10.0	75.0	19.2	9.6	19.4	29.1
Blackwater fever ...	2.5	—	21.2	3.2	9.7	
Enteric	18.0	—	—	12.9	8.2	
Dysentery	10.0	—	1.9	—	3.7	
Small-pox	2.5	—	1.9	—	1.5	
Cholera	2.5	—	—	—	0.7	
Mediterranean fever	2.5	—	—	—	0.7	
Anaemia	—	8.3	9.6	—	4.4	
Pulmonary tuberculosis	—	—	—	12.9	3.0	
Old age	—	—	—	25.8	6.0	
Typhus	—	—	—	3.2	0.7	
Tick fever	—	—	1.9	—	0.7	
Sleeping sickness ...	—	—	1.9	—	0.7	
Mania	—	—	3.8	—	1.5	
Heart disease ...	—	—	—	6.4	1.5	

Madagascar.

The records of lives invalided only total 14 (5 men and 9 women). Malaria is very prevalent, occurring in almost epidemic form at times. Enteric is met with, and the only interest of these few figures depends on the fact that 5 were invalided for valvular heart disease, 2 for nervous breakdown, 2 for enteric, 2 for malaria. Most of the missionaries live at an elevation of about 5,000 ft., and the combination of elevation and prevalence of malaria seems to predispose towards arterio-sclerotic valve defects. "Malagasy heart" is, I believe, a well-known local condition recorded by French physicians there, and from the observations I have been able to make on returned missionaries from Madagascar I believe the condition to be an arterio-sclerotic one, with mural weakness. Dr. C. J. A. Moss of Madagascar, a medical missionary of long experience there, has stated in a recent paper published in the *Journal of Tropical Medicine and Hygiene*, that valvular disease is common among the natives, and is probably due to strain and hard conditions of life, and not to acute rheumatism, which he does not believe exists in the island. He also refers to 85 missionaries examined by him during his residence; 12 had cardiac trouble, 4 being due to valvular defects, and 8 degenerative, the result of malarial fever. Of 16 cases of missionaries who retired, invalided home, 5 had heart disease, 4 from malaria, 3 from neurasthenia, and one each from pulmonary tuberculosis, anaemia, asthma, and mental weakness. Most of these are, I think, included in my 14 cases.

Persia.

In this country the lives are only 29, of which 5 were invalided—neurasthenia, typhus, remittent fever being the causes.

Comparative Health Statistics.

In addition to the foregoing statements, as regards the Church Missionary Society statistics, I have worked out the average years abroad of missionaries for each sex, periods of invalidings at home, the percentage of invalided

for each country, and the incidence of disease. The comparative risks to health based on these figures are shown in the following tables:

TABLE V.—*Church Missionary Society Records.*

	Number of Recorded Lives.			Percentage Invalided.	Percentage of Incidence of Disease.	Percentage Free of Disease.
		Men.	Women.			
East Africa, Uganda ...	125	60	65	20.0	88.0	12.0
West Africa, Nigeria ...	65	31	34	18.5	86.1	13.9
Arabia, Egypt, Palestine ...	71	19	52	26.7	77.5	22.5
Persia	29	19	10	17.4	65.6	34.4
India	379	188	191	24.5	73.6	26.4
Ceylon	56	25	31	5.3	75.0	25.0
Southern China	123	40	83	8.1	65.9	34.1
Central China...	98	31	67	20.4	69.39	30.61
Japan	105	29	76	16.1	61.9	38.1
Total	1,051	433	618	17.4*	73.7*	26.3

* Average.

From this table it will be seen that Egypt, Arabia, East, Central, and West Africa, are on the whole the countries which offer greatest risks to health.

TABLE VI.—*Chief Causes of Invaliding.*

Chief Causes of Invaliding.	India.	China.	Japan.	Africa.
	Per Cent.	Per Cent.	Per Cent.	Per Cent.
CLASS I.				
Nerve conditions of a neurasthenic type	20.6	25.0	81.25	20.8
Insanity	4.8	8.8	—	1.5
CLASS II.				
Enteric fever	16.6	9.8	—	8.2
Malaria	13.3	11.8	—	19.4
Dysentery	6.4	5.9	—	3.7
Pulmonary tuberculosis ...	3.2	10.8	—	3.0
Small-pox	1.6	1.4	—	1.5
Blackwater fever	—	—	—	9.7
Percentage due to Class II diseases (largely preventable)	41.1	39.7	—	45.5

I have just had sent me by Dr. Leopold Hill, medical examiner to the Church Missionary Society, a record of 100 invalidings—men 35, women 65—in that society from 1908–12. He has unfortunately been prevented himself from attending to-day and giving a full report of these records. I have not had the time to analyse carefully the statistics, but find as to causes of invaliding the following figures emerge:

	Per Cent.	
Neurasthenia	28	
General debility	9	
Anaemia	7	
Enteric	7	
Malaria	4	
Bowel disorders	4	8
Colitis	2	
Dysentery	2	
Heart trouble (chiefly valvular)	3	
Pulmonary tubercle	2	
Tubercle of kidney	1	
Sprue	2	

The slightly lower incidence of enteric is probably due to the general practice of inoculations which has during the last few years been introduced.

CONCLUSIONS.

1. That a missionary's work involves great risks to health.

2. That capacity for "nerve strain" is a real factor to be considered in passing candidates to go abroad, and therefore it would be wise to exclude those who have any decided taint of mental instability in their family history, also those of highly nervous temperaments. The impulsive, enthusiastic, but easily depressed person will not stand the strain of the conditions inseparable from a tropical life and work, unless they have also a leaven of common-sense, humour, and good self-control. Isolation, overwork, under-staffing of stations, the heavy incidence of minor illness which does not immediately necessitate invaliding, the possible experience of scenes of violence and alarm (especially during recent years in China), will try the most placid or callous temperament, and largely accounts for the heavy incidence of this class of disease—that is, 20 to 80 per cent. of invaliding.

3. The prominence of a large class of infectious diseases calls for note, since an average of 42 per cent. of invaliding is due to them. Against this latter class many safeguards can be taken; small-pox should never occur if revaccinations were enforced. Enteric fever should be greatly diminished with wider and more frequent recourse to inoculation and extended knowledge as to methods of infection amongst the laity.

Malaria and blackwater fever can be more nearly controlled if more persistent efforts were made to efficiently teach all who go abroad the facts so universally acknowledged as to malarial prevention. Referring to the section I represent, many societies do not even yet see the necessity for any systematic instruction on health and hygiene for their missionaries, whilst they insist on a too long course (as it seems to the writer) in theological studies, if health and life have to be sacrificed for it.

4. The frequent appearance of pulmonary tubercle—due generally to infection abroad—points to the necessity for eliminating by medical examination all those who may from their family or personal history have shown predisposition to the disease.

5. Most of the lives considered in the above statistics are select lives, the examinations by many of the societies being as strict as for a large insurance policy, but the need for such medical criticism and elimination of the unfit still needs emphasizing to certain other societies and associations.

Enteric and Tuberculosis Cases.

In regard to enteric fever, I have details of 133 cases, occurring in 69 men and 64 women in the following countries: India, 77; China, 26; North Africa, Egypt, Syria, 11; Persia, 6; and under 5 in South Africa, Ceylon, Japan, South America, Bahamas, and Spain. The proportion of these cases which occurred at various periods of service are shown in the following table:

Period of Service.	Deaths from Enteric, 54.	Incidence of Enteric, 133 (with recovery).
Within first 3 years ...	48.1 per cent.	51.9 per cent.
Within first 5 years ...	65.4 per cent.	62 9 per cent.
Within first 6 years ...	70.0 per cent.	70.3 per cent.

Forty of the cases occurred after six years and 5 in persons who had served from fifteen to thirty years. The conclusion is obvious:

1. All persons going abroad should have knowledge as to the usual modes of infection by this disease.

2. The general practice of inoculation with antityphoid vaccine should be carried out every three years, if possible, for most countries, especially China, India, North Africa, and Palestine.

There is one question I should like to suggest in order to elicit information. Is there any brief negative phase following inoculations during which the patient is more liable to contract the disease if exposed to infection? I know of a few isolated cases where missionaries, going abroad immediately after inoculations, contracted enteric within a few months.

Tuberculosis.

Pulmonary tuberculosis comes third in order of frequency in China, and seventh in India as a cause of invaliding, whilst occasional cases occur in other countries. This would not be remarkable had there not been by process of medical examination an elimination of susceptible persons, though it must be owned some

societies are less strict in their medical regulations than others as regards this disease. The Church Missionary Society had in their records of 1,051 lives only 7 cases of such invaliding—occurring in 4 men and 3 women—and 5 deaths from the same cause; in one case only was it recorded that there was family predisposition. The other societies contributed 32 cases of invaliding and 42 deaths. These 39 cases occurred in 18 men and 21 women, the average age of the men being 42.2 and of the women 34.4, while the lengths of service were 12.4 and 7.5 years respectively. All the cases were pulmonary except 2, these being spinal tuberculosis and peritoneal.

In 33 per cent. of those invalided for tuberculosis there was a decided family predisposition or direct earlier personal infection. This percentage might have been higher had details been afforded in the other 22 cases. An interesting question arises as to whether there is a permissible limit of tuberculous infection, such as a past history of tuberculous glands, in a candidate applying for foreign work and residence amongst races where tubercle is known to be prevalent. Certainly, I believe, no case of reputed recent healed pulmonary tuberculosis should be passed, provided the diagnosis was fully established; nor where there was a strong and near family history of tuberculosis, especially if occurring on both sides of the family. When the family history is only slightly affected one would be guided by the condition of the candidate, and perhaps accept only for a non-tuberculous sphere of work, if such can be found.

I fear the gaps in this paper may be great, and much more information is, of course, desirable; but I must ask for some forbearance, as, apart from the valuable and systematic Church Missionary Society statistics, no attempt had been made by other societies to record what one might term vital statistics of missionary lives, and therefore there has been considerable difficulty in this initial effort, in gathering together the evidence on which are based conclusions which I hope will lead to further discussion.

II.—Colonel R. J. S. Simpson, C.M.G., A.M.S.(ret.).

1. Materials.

The materials used for the consideration of this problem have been the Army Medical Reports from 1886 to 1895, 1896 to 1905, and 1906 to 1910. The numbers invalided per 1,000 of strength over each of these periods have been compared. These three periods correspond fairly well to three stages in the development of our knowledge of the causes of disease, and therefore with our ability to deal with them by hygienic measures.

In the army, practically all the cases to be invalided from foreign stations are first of all sent home, where each case is reconsidered after further treatment. Those remaining unfit are "finally discharged." We have, then, practically parallel and comparable records of those temporarily invalided and of those finally discharged.

2. Standard.

We are first of all faced by the necessity of finding some standard by which to measure the results at any given station. We cannot use the United Kingdom, because there is no temporary invaliding, and as regards final discharge the conditions are not similar. Not only is there a considerable amount of permanent invaliding among young soldiers who have never been abroad, but there is also the invaliding among men who have returned from abroad in the usual course of duty but in whom a disease contracted abroad has only become of serious import after their return home. So that the invaliding debited against foreign stations is slightly less than it should be, while the home rates are slightly increased.

The only method is to compare groups of diseases at the whole of our foreign stations, but here again we are hampered by the great variations in the populations exposed; in some of the smaller stations an accidental small increase in the number of cases results in an unduly large increase in the ratio, even over a period of five years. Again, in India since 1907 men have been sent to the hills instead of being invalided home, which has reduced the temporary and permanent invaliding since that year.

Details have only been given for the quinquennium 1906–10, but the previous periods show the same characteristics, as will be seen later in the case of India.

3. Invaliding due to Tropical Disease.

Temporary Invaliding.—The average of the ratios per 1,000 for all foreign stations for *all diseases* between 1906 and 1910 was 24, of which 8 were due to *tropical diseases*, which is usually malarial fever. This was only important at the following stations:

Mauritius—causing	67	per cent.	of the	total invaliding
W. Africa	,, 53	,,	,,	,,
S. China	,, 30	,,	,,	,,

The percentage relation is important in these three stations, which have small garrisons; both sides of the comparison are affected similarly.

Permanent Invaliding.—The average of the ratios at the same stations for the same period was—for *all diseases* 9.2 per 1,000, and for *tropical diseases* 0.25.

From Mauritius 10.7 per cent. of the total invalids were discharged finally on account of malarial fever; in no other station was the proportion so great.

In India between 1907 and 1911, both inclusive, the following were the actual numbers of cases invalided permanently for tropical disease.

Enteric fever	21
Kala-azar	3
Beri-beri	4
Malaria	18
Dysentery	1

or a total of 47 cases in five years on an average strength of about 72,000 men. It is surprising to find how few cases are invalided for dysentery, hepatitis, enteritis, or diarrhoea.

Debility holds a comparatively high place in the tables. This term, like "anaemia," really conceals facts. Many of the cases are subsequent to acute or recurrent disease, and should be recorded under that heading. But, even including all cases of debility and anaemia with the tropical diseases (which is, of course, not correct), the total still remains insignificant among the causes of permanent invaliding. The total loss by death and invaliding is a different matter.

4. Invaliding due to Non-Tropical Disease.

The more important diseases causing temporary or permanent invaliding are, in order of magnitude, these:

Temporary.	*Permanent.*
Tropical diseases.	Nervous and mental diseases.
Nervous and mental diseases.	Tuberculous disease.
Unnamed diseases.	Diseases of special senses.
Tuberculous disease.	Valvular and functional diseases of the heart.
Diseases of special senses.	Unnamed diseases.
Valvular and functional diseases of the heart.	

("Unnamed diseases" includes all those not specifically shown here. "Special senses" here includes the eye.)

The predominance of nervous and mental diseases is distinct; of those sent home 85.5 per cent. are finally discharged. The commonest forms of disease are epilepsy, melancholia, and delusional insanity. In India, between 1907 and 1911, of the total permanent invaliding for these diseases:

Epilepsy accounted for ...	...	23 per cent.
Melancholia accounted for ...	...	21 ,,
Delusional insanity accounted for	...	17.5 ,,
Altogether 61.5 per cent.		

Neurasthenia is not recorded frequently among the men, perhaps less frequently than it might be. It attracts attention among officers, but this is, perhaps, not more than a part of the general increase in the community, as it is by no means infrequent among officers whose only service has been at home.

Tuberculous disease is for practical purposes tubercle of the lung. The incidence, death, and invaliding rates for tubercle at our foreign stations for the decade 1895–1904 were examined some years ago, and the conclusion arrived at was that, taking the United Kingdom as the standard, variations due to local conditions at the various foreign stations were surprisingly small, especially as regards the aggregate of the death and invaliding rates. Since then

the invaliding rate has risen, because now every man is invalided as soon as the disease is diagnosed.

South China and Ceylon showed a definitely higher rate than any other foreign station during the period 1906–10.

Diseases of the special senses are almost entirely those of the eye (errors of refraction) and ear (middle ear). In India during the period 1907-11, of the total permanent invaliding under this head, 19.3 per cent. was due to refractive error, 53.5 per cent. to diseases of the middle ear, or a total of 72.8 per cent.

Predisposition and antecedent infection are, then, important factors in the causation of diseases included in the groups referred to above.

Valvular and Functional Diseases of the Heart.—In India in the period 1907–11, of the total permanent invaliding for diseases of the heart and circulation, valvular disease accounted for 64.4 per cent., functional disease for 22.1 per cent.—in all 86.5 per cent.

In relation to valvular disease, rheumatic fever is not uncommon at any station. Many of the cases of functional disease are really the sequelae of acute disease, and are not cardiac in origin. Of the less frequent diseases:

Digestive System.—Hernia and defective teeth are the most important. A few cases of sprue are included here.

Organs of Locomotion.—Malformations of the feet (congenital) and diseases of the joints (acquired) are the most important.

One may say, then, that an appreciable part of the invaliding for non-tropical diseases is due on the one hand to congenital structural defects which are not influenced to any great extent by a tropical environment, and on the other, to antecedent infection or to that aggregate of partially known qualities which we call predisposition.

5. Relation between Temporary and Final Invaliding.

There is a comparatively close agreement between the order in which the different stations appear when placed in series according to the magnitude of the ratios for temporary and permanent invaliding respectively ($r. = 0.5901 \pm 0.122$). So that the temporary invaliding from a station is a fair indication of what permanent loss may be expected.

6. Relation between Invaliding for Tropical and Non-Tropical Disease.

It is interesting to inquire how far statistics support the general impression that a tropical environment influences the incidence and severity of non-tropical diseases as far as this is shown by invaliding.

Arranging the foreign stations in two series in order of magnitude of the invaliding ratios for tropical and non-tropical diseases, we find a very strong resemblance between the two series, with an approximate correlation coefficient of 0.75. Hence we are justified in saying that the invaliding-rate for non-tropical disease on the whole rises and falls with that for tropical disease; or, putting it another way, at most stations the relative magnitude of the invaliding ratio depends on all classes of disease, not only on that for tropical disease.

The important question here is whether this rise in non-tropical disease, with an increase in tropical disease, is determined by coexisting and antecedent tropical infection or whether it is the result of other factors. One knows, as a matter of fact, that as cases are invalided for the more important disorder, many cases invalided from infective stations for non-tropical disease also suffer from some tropical infection, and in a good many cases this has increased the severity of the non-tropical disorder. In addition to this experience of the individual case, we may compare ratios in a large population at different periods of increasing knowledge of hygiene and improvement in methods of prevention, as in the case of India over the three periods 1886–95, 1896–1905, and 1906–1910. Using the ratio per 1,000 of invalids sent home during the decade 1886–95 as a standard, we obtain the following ratios:

	Invalids sent Home.	Finally Discharged.
1886–1895	100 ...	... 53
1896–1905	134 ...	... 58
1906–1910	70 ...	... 31
1911	30 ...	... 26

The rise in the period 1896–1905 is due to the South African war, while part of the decrease in the last quinquennium is due to the policy of sending men to the hills instead of home; also during the last period there was a very great reduction in venereal disease. But the increase and decrease in each group of diseases is fairly regular over the different periods. Hence, the conclusion that those conditions which influence the prevalence of tropical disease also influence the prevalence of non-tropical disease is supported by the statistics available.

Comparing these different periods and comparing the different foreign stations for the same period with the United Kingdom, one sees that the same diseases are numerically important in temperate as well as tropical stations, and that the only difference is in degree, not in kind.

7. Conclusions.

(*a*) Tropical diseases of themselves produce only a relatively large temporary invaliding.

(*b*) The temporary invaliding from a station for causes other than tropical disease, taken generally, rises and falls over the whole of our foreign stations with the invaliding for tropical disease.

(*c*) The important causes of invaliding, temporary and final, are in order of importance:

Nervous and mental diseases.
Tuberculous disease.
Diseases of the special senses, including the eye.
Diseases of the heart, functional and organic.

(*d*) These are the same causes which are effective in Great Britain and almost in the same order.

III.—William F. Law, M.D.Dub.,

British Guiana.

The observations to be set forth are based on work done in British Guiana, which was confined to no particular class, but included Government officials, employees on sugar plantations, business men and their families. If it is admitted, as most do, that the white races are unfit for permanent residence in tropical countries, it follows logically that Europeans who go to these climates return at more or less regular intervals, if they are to maintain their health and energy for work. There are some apparent exceptions to this rule, but they are few. The primary cause of invaliding is climatic; it is the unpreventable factor that comes into the great majority of cases.

My views on this point are not in agreement with those of some distinguished workers, notably Colonel Gorgas, who is quoted by Dr. David Thompson, in a paper recently read before the Society of Tropical Medicine and Hygiene, as saying that "the work on the isthmus will demonstrate to the world that the white man can live and work in any part of the world, and that the settling of the tropics by the Caucasian will date from the completion of the Panama Canal."

I maintain that, although Colonel Gorgas's brilliant work on the isthmus of Panama has shown how much can be done by energy and organization, there is, on the contrary, every reason to believe that, even if all tropical diseases were wiped out, climate would still remain a powerful enemy to the settlement of tropical countries by the Caucasian.

Apart from climate, by far the most fertile source of invaliding in British Guiana is malaria, which accounts for nearly three-fourths of the temporary invaliding, and is an important element in bringing about permanent disability. The disease is, indeed, so common that it is treated with too little respect. People often get what we familiarly term "a touch of fever," without lying up at all, or do so for at most a day or two. This accounts for many recurrences, and it is well to emphasize the fact that invaliding, both temporary and permanent, would be less if after every attack, no matter how slight, rest for a day or two and continued use of quinine were looked on as essential.

Dysentery and enteric fever are, perhaps, the only other acute diseases deserving of notice as causing any special invaliding. In our towns and at sugar plantations the former is certainly not common, though a few cases do occur. It is more in evidence amongst the few Europeans who work in the interior at gold digging or on timber grants.

Enteric fever, which was formerly a very rare disease, has within the last ten or twelve years become comparatively common in Georgetown and on some sugar estates, and the amount of invaliding from this cause is becoming considerable, if not alarming.

Blackwater fever we see little of; yellow fever has been absent from the colony since 1888; plague, cholera, and beri-beri are unknown; and the trypanosome has not yet visited us. Filariasis and intestinal parasites, though extremely common amongst our working classes, are practically absent from our European population.

Nervous disease is, perhaps, next to malaria the most frequent cause of prolonged and permanent invaliding. It is not so much that the lesions are grosser, involving the locomotor system, as that the so-called functional derangements vary from mere nervous irritability or slight mental depression to acute melancholia with suicidal tendency. These are mostly to be found in persons occupying responsible positions, such as heads of departments, professional men, managers of estates, and business men.

Heavy work of a responsible nature is not easily borne in the trying conditions of tropical life, and frequently leads to the condition commonly spoken of as "nervous breakdown." In British Guiana we see a great deal of this; possibly our low-lying country, with its constant moist heat, is favourable for its development. Be the cause what it may, we know that when the placid man becomes nervous and irritable, or when mental depression takes the place of the usual cheeriness, the sooner that individual goes for a good long leave to a better climate the better.

Valvular disease of the heart is not more common than in England, possibly less so, owing to the total absence of acute rheumatism, but still heart affections figure largely amongst the causes of invaliding, being, perhaps, next in importance to nervous diseases. The term "tropical heart" has been used by some writers, but I do not think there is any condition of the heart peculiar to the tropics. A weakening of the heart muscle, accompanied by a greater or less degree of dilatation, very frequently follows attacks of acute disease, just as it will in any country, but the point seems to be that it takes less to produce this condition in a tropical than in a temperate climate.

Anaemia as a cause of invaliding must also be mentioned. A great deal of it, due to intestinal parasites, is met with in British Guiana amongst the labouring population, but amongst Europeans this is extremely rare, and in this class the condition must be ascribed chiefly to climatic influences and malarial fever.

Strain of work is not infrequently overlooked by writers, who seem to think that life in the tropics is mostly one of comparative ease and luxury. Few Europeans are capable of as much work in a hot climate as at home, and yet they are not uncommonly called to do more. Little wonder that breakdown occurs.

Speaking generally, it may be said that the abuse of alcohol is not greater in British Guiana than in England, but its effects are more rapid and serious. It is not a question of actual drunkenness, which is rare, but the habitual free use of alcohol which stops far short of intoxication. The climate is to blame for much of the over-indulgence of this sort.

To epitomize the conclusions drawn from my experiences, it would appear that permanent invaliding is most frequently demanded in cases of nervous disease, heart affections, and obstinate anaemias; whereas temporary invaliding, if of sufficient duration, will, as a rule, set right an otherwise healthy person suffering from malaria, enteric fever, dysentery, or other acute disease. Particular stress is to be laid on the qualification in the last sentence, as I have so often seen men, particularly overseers and junior officials, who, perhaps, could ill afford long leave, go home for two or three months after severe malarial fever, only to be laid up again by serious recurrences immediately after return to the tropics.

I would conclude by remarking that more attention to early symptoms, particularly with regard to slight malarial attacks, is required; in malarial countries the regular daily use of quinine as a prophylactic is a necessity; longer rest after acute malarial attacks have passed off should be insisted upon; longer leave to temperate climates when such is needed; fairly frequent return to temperate climates even in the absence of acute illness; great caution with regard to the use of alcohol; careful selection of candidates for work in the tropics.

DISCUSSION.

Colonel Sir William Leishman, F.R.S. (President) called attention to a branch of the subject which had not so far been mentioned, and which might perhaps be thought to be excluded by the wording of the title of the discussion. This was the advice which should be given to those invalided from the tropics in respect of their return thereto. In the speaker's opinion tropical physicians had few graver decisions to make than in many of these cases, where a man's whole career might depend on whether he was advised that he should never return to the country from which he had been invalided. In some cases, he thought, such advice was hardly justifiable on our present knowledge; and he was familiar, as many others must be, with instances in which the advice, by stress of circumstances, had been disregarded and the individual had nevertheless returned to his station and enjoyed good health for many years. He hoped, therefore, that some of those who followed would speak on this branch of the subject, especially in connexion with blackwater fever, sunstroke, and neurasthenia. On the points raised by Dr. Price in connexion with the prophylactic use of antityphoid vaccine, he might answer in the light of his experience with this vaccine in the army. The advantage of employing a local strain of *B. typhosus* for the preparation of a vaccine appeared to him purely theoretical, and he had no evidence in support of this proving a useful modification. Reinoculation, in his opinion, should be carried out after a lapse of two and not of three years, since immunity rarely extended to this latter period. As regards the danger of a negative phase, he believed strongly, and on good evidence, that this was, with the present system of dosage, purely imaginary.

Dr. C. F. Harford (London) pointed out that there was a special difference between the military and missionary statistics, the latter including women as well as men. Both classes, however, might be regarded as selected lives. As one who had been for eight years physician of the Church Missionary Society, and was familiar with most of the individuals from that society quoted in Dr. Price's tables, the result of his general observations led him to conclude as follows: Bowel disorders he regarded as directly or indirectly the most important cause of invaliding, and apart from severe nerve troubles the most serious. Enteric fever undoubtedly had been the most serious cause, but with the employment of antityphoid inoculation it was lessened. Sprue was again a common and serious cause of invaliding. Colitis had proved to be very persistent and often difficult to deal with, whilst intestinal parasites were probably more commonly associated with intestinal disorders than was generally recognized. Bowel disorders seemed to be most prevalent in China and India. Nervous disorders, the speaker thought, were in many cases the result of fevers and bowel disorders, but there were special climatic causes, especially in Japan, which contributed to produce neurasthenic symptoms. They might be partly due to the electrical conditions of the atmosphere, partly due to difficulties of the language and to the strange surroundings of foreign lands which constituted nervous strain to those unaccustomed to them. Fevers seemed to be the most common cause of invaliding in Central Africa, and he would place first in importance blackwater fever and, especially in Uganda, tick fever. Malta fever also had to be reckoned with. In regard to women's diseases, he had noted a special prevalence of fibroid tumours in China and Japan. Troubles connected with the climacteric also had to be remembered, especially neurasthenic in character. Arthritic troubles of a serious character he had noted, especially in cases from the Punjab, but he did not desire to lay stress on this. Tuberculous cases would appear to be chiefly due to infection. As regards the figures of invaliding from different countries in Dr. Price's tables, he thought that the very favourable figures for Ceylon were probably accidental. He also thought that Egypt should not be included with Palestine or Arabia. As to the return to the tropics of those who had suffered from blackwater

fever, each case should be treated on its merits. Professor Koch had advised that if a man had blackwater fever he should, as soon as possible after the fever was over, start taking small doses of quinine until he got back to the regular prophylactic dose, and that if he continued this he might continue to reside in the country where he had contracted the disease. This the speaker believed to be good advice. If the individual had an exceptionally severe attack with cerebral symptoms or any tendency to suppression of urine, then he should not return. If, however, the attacks were not exceptionally dangerous and the patient could and would take quinine prophylactically, then he might return.

Dr. DUNCAN WHYTE (China) said that the importance of contact infection in the causation of tuberculosis was pronounced, as shown by the fact that all the missionaries referred to by Dr. Price had been examined for tuberculosis before they were sent abroad, yet the percentage invalided home from this cause varied from 3 per cent. in Africa and India to 18 per cent. in South China. For the proper safeguarding of the lives of Europeans in South China, where tuberculosis was so rife amongst the natives, it was desirable that the household servants should be carefully examined. Beds should not be made and food should not be prepared by servants who were expectorating tubercle bacilli, or yet by those who were possibly typhoid carriers. In regard to the prevention of invaliding from neurasthenia, one contributory cause of this condition was over-stimulation of the optic nerve by glare, which could be minimized by the use of dark glasses. An effort should also be made to secure that hypersensitive people were not allowed to go to the tropics. It was well to select for the tropics a man who had a nervous system sufficiently blunted to be able to tolerate fairly well the glare, and sometimes the noise, associated with residence in the tropics.

Major W. S. HARRISON, R.A.M.C., said that during recent years there had been a very great reduction in the total numbers sent home from the army in India on account of tropical disease. Part of this reduction was due to a general improvement in the health of the army, part of it to more effective treatment, and a part to the more extended use of hill stations. It had been learnt that it was quite possible to treat in hill stations a large number of cases which would otherwise be invalided, but there nevertheless remained a portion which had to be sent home. With regard to enteric fever, from 3.6 to 6 per cent. of those admitted were formerly sent home, and 0.4 per cent. were finally discharged. Now 1.7 per cent. of the patients were sent home, and 1.3 per cent. were finally discharged. This apparent increase in the percentage of those finally discharged was probably due to the invaliding of carriers (as a matter of fact, the percentage only represented 3 cases). For dysentery 4.5 per cent. of those admitted used to be sent home, but now only 1.5 per cent. were thus treated; at the same time, the numbers of those finally discharged had been reduced from about half per cent. of admissions to less than a tenth per cent. Malarial patients used to be sent home at a rate of, approximately, 1 per cent. of cases; now 0.1 per cent. only were sent home. These improvements had been accompanied by a reduction in the case mortality of typhoid fever from 22 to 13 per cent., and of malaria from 0.2 to 0.09 per cent., while the case mortality of dysentery had remained stationary at about 3 per cent. These figures showed that where hill stations were available it was quite possible to deal with most of the principal tropical diseases without sending the cases home. There remained, however, a considerable number of patients who required change to England; this was especially in regard to cases of dysentery and tropical diarrhoea. Here the quality of the food was of such importance that change to a country where decent food was available became in many cases absolutely necessary. Neurasthenic conditions and the sequelae of heat-stroke always called for a return home. The speaker had been particularly struck with the high proportion of neurasthenics among the officers, either primary in origin or following such ailments as chronic bowel disease. It was difficult to sort them out from the statistics, since so many cases were shown among the primary causes, but there was no doubt that once a patient developed marked neurasthenia he would go steadily worse if allowed to remain in a tropical climate. When the neurasthenia had been severe and prolonged, only very few cases could safely be allowed to return to the tropics without risk of a second breakdown.

Dr. M. CAMERON BLAIR (Nigeria) said neurasthenia was a matter of class, and it was not surprising that officers should suffer more than the men; the latter were and always had been accustomed to living in a crowd, whereas men of the officer class, who had been accustomed to their own quarters at home, were liable to be quartered with other men in the tropics. Neurasthenia really signified repression of the feelings which by want of expression disturbed the mental balance. Officers' work in the tropics all too often signified a lonely life without opportunity of an outlet for overcharged conservation of force. Cardiac dilatation was largely due to the strenuous work the officer had to do sitting up half the night perhaps writing, in a exhausted state, the reports of the day's work. Malarial fever was rarely treated effectively, and this accounted for men at home suffering from recurrent attacks. An attack of malarial fever meant a three months' course of quinine treatment after discharge from hospital. If a patient after recovery from blackwater fever had a sound heart and sound kidneys there was no reason why he should not return to the tropics provided he submitted to proper antimalarial treatment. Quinine should be administered in solution or intramuscularly, not in tabloids hopelessly hard and indigestible.

Dr. MALCOLM WATSON (Federated Malay States) said that his experience had been that women in particular appeared to suffer more than men from life in the tropics, apart from any disease, and it took the form of neurasthenia; a change for a month each year to a hill station seemed to prevent this. With regard to men, neurasthenia was often associated with loss of weight, and increase in the weight would benefit this condition just as noticeably as it did with acute nervous troubles which found their way into asylums in England. The question of invalids returning to the tropics seemed to depend on the part of the tropics the man returned to. If he had suffered from blackwater fever he could go to a less malarious place, and if the place were at all malaricus small doses of quinine were of infinite value. When the speaker was in Panama recently the authorities were good enough to supply him with figures relating to the invaliding from the zone. They showed that the same diseases were on the list as in other countries. It was not surprising that neurasthenia and insanity should figure largely when the "hustle," the blasting, and noise incident to the tremendous undertaking represented by the work at Panama were duly considered.

SOME RECENT OBSERVATIONS ON SPRUE.

By JAMES CANTLIE, M.B., F.R.C.S.,
London.

IT is disappointing that sprue, in common with many other intestinal disorders, seems but slowly to emerge from a mere detail of signs and symptoms and empiricism in treatment. Dr. P. Bahr has made a careful study of sprue in Ceylon, and it is hoped an advance may be anticipated as the result of his labours; and Dr. Castellani has given us information concerning intestinal fungi which is interesting, and may prove of supreme practical value.

It is not my intention to recount the signs and symptoms of sprue, which have been repeated in many publications, but to draw attention to a few points concerning which, in speaking to colleagues of sprue, I find seemed unnoticed and unpublished.

1. Temperature in sprue. A continued fever coming on in chronic sprue cases almost certainly indicated the last and fatal stage of the disease. Fever is not a characteristic of sprue; in fact, a temperature a degree or so below the normal is the rule. If, however, in long-standing cases, it may be of some years' duration, an increase of temperature varying between 100° F. and 102° F. obtains, a fatal issue may be anticipated in a month or two. Quite recently, however, a chronic case came under my care in which fever was present before I saw the patient, and life

was prolonged for four months afterwards. Such cases are quite hopeless; I have never seen a patient with continued fever of over 100° F. recover. It would appear as if a toxin had developed which the tissues were incapable of keeping in check.

2. Neuralgia of the anus is a late development in sprue, and I have seen it only in fatal cases. At times a fissure or small ulcer may be present at the anus, but not infrequently the most careful search fails to discover any local lesion. It is common in sprue to meet with an itch anus accompanied by some dryness and discomfort, but this is quite different from the acute suffering referred to. The presence of this disturbance renders the last few weeks of the sprue patient's life miserable in the extreme.

3. Tetany. Within the past eighteen months I have met with 6 cases of muscular spasm of a general and severe character in cases of sprue of long duration and when accompanied by pronounced anaemia. I have never had my attention drawn to this condition, during a long experience of the disease, until lately, nor have I seen it prominently referred to in the literature. At first I believed the tetanic spasms were due to the medicinal treatment being used, but this was subsequently disproved. In 2 cases the spasms were present before the patients came under my notice. The tetany begins usually in the legs and hands; it is referred to by the patients as "cramp." The fingers are flexed and pressed firmly against the thumb or doubled up in the palm of the hand so rigidly that it is impossible for either the patient or doctor to separate them. Not only are the extremities involved, but the muscles in the neck, face, chest, and abdomen become involved. Fever is usually present, the temperature rising as high as 103° F. The symptoms may become alarming, the circulation becoming affected, as shown by the congested features, intermittent pulse, and cardiac distress. In severe cases the patient may become unconscious for some minutes, and death seems inevitable. I have never, however, seen a patient die in this state. The attack may last a few hours or one or two days, the symptoms gradually subsiding. These attacks do not imply a fatal issue to the malady.

4. Sigmo-rectal trouble is not an uncommon sequel to long-standing sprue, as it so frequently is in cases of chronic dysentery and colitis. This is a condition I have dealt with in previous papers, and need not be again referred to here. Shortly stated, the narrow sigmoid flexure is prolapsed into the rectum for a distance of an inch or two; the invagination leads to congestion and thickening of the parts. By digital examination per rectum, a large tender mass may be felt at a point as high as the finger can reach, at the upper end of a ballooned rectum, or it may be only by the sigmoidoscope that the lesion can be diagnosed.

The protruding sigmoid when seen can be made out to be swollen, congested or ulcerated, and covered by a slimy mucus as it oozes from the lumen of the bowel. When this stage is reached in sprue, as in colitis and post-dysenteric states, large quantities of mucus, occasionally stained with blood, comes away in the stools. As a rule, the frothiness, pallor, and bulk of the stool so characteristic of sprue disappear; in fact, the signs and symptoms of sprue would seem to disappear, including even the soreness of the tongue, and the condition becomes one of sigmo-rectal abnormality, consisting of prolapse of sigmoid, thickening of bowel, consequent obstruction, accompanied by the mucous discharge attendant in stricture of a mucous channel. As in strictured urethra mucus collects behind the seat of the lesion, so in the bowel mucus, but to an amount corresponding to the size of the bowel to the size of the urethra, obtains. The treatment when mucus becomes the most noticeable feature of the stools in cases of sprue must be altered, for the actual disease has changed to one of a local lesion at the seat of the sigmo-rectal pylorus.

Treatment.

As regards treatment, I have lately used collosol argentum (Crookes)—a solution containing the metal silver in a colloid state. This is a preparation by Professor Crookes of silver in which the actual particles are of extreme minuteness and exhibit, under ultra-microscopic conditions only, marked "Brownian" movement. Bacteriological tests show that the *B. coli communis* is killed in ten seconds, and no microbe is known that is not killed in laboratory experiments in six minutes. Being non-toxic, the dose can be increased from 1 to 2 or more drachms twice or thrice daily. In several cases of sprue I find that in from 76 to 118 hours stools lose their frothiness and their bulk, and a fairly solid motion can be anticipated showing the presence of bile. This has occurred even in the last stages of sprue when the temperature was over 101° F. and when death was anticipated.

As regards diet I adhere to the meat treatment of sprue, and when recurrences take place and persist I advocate for three days nothing but milk, three days nothing except meat, and three days a strict farinaceous diet; but no mixture of these on any account. Strawberries continue to hold their position as a curative agent. When the short strawberry season is over, ripe gooseberries (not in pies) in quantity, or raspberries or the juice of blackberries (brambles) do almost if not quite as well. As a medicine, powdered cuttlefish bone with native carbonate of soda is a remedy which has stood the test of some thirty years, and retains its position. When the disease alters its features and the sigmo-rectal pylorus becomes the seat of trouble, sea-water enemata answer well, as in similar conditions of post-dysenteric lesions and long-standing colitis.

DISCUSSION.

Major W. S. Harrison said he had seen one case of sprue with marked tetany. It was the tetany which brought the patient under notice. He had had diarrhoea and wasting for some time, but he was a stupid man, and took no notice of it until the tetany developed. With regard to the sore mouth, he had noticed that when a patient got an intercurrent attack of acute diarrhoea the mouth symptoms improved; when the stools got more into the characteristic sprue condition, and especially when they became solid, the mouth symptoms recurred. Acting on this, the speaker washed out the bowel with normal saline—3 pints daily—whenever mouth symptoms were present; it certainly seemed to keep down the mouth symptoms, but these recurred as soon as the washing out was discontinued. It looked as if the sore mouth was due to the absorption of some poison from the large gut.

PHLEBOTOMUS FEVER AND DENGUE.

By Lieutenant-Colonel C. Birt, R.A.M.C.

The subject of phlebotomus, or sandfly fever, was last discussed by this Section at the meeting of 1910. Since then considerable advances have been made in our knowledge of the extension of this infection and of the habits and distribution of the phlebotomus throughout the world. It will be recalled that in the year 1908 Doerr proved by experiment that the summer febricula which year by year attacked the Austrian troops stationed in Bosnia and Herzegovina is of specific origin. This fever is ushered in with chilliness, but not with the severe rigor characteristic of ague; the temperature rises rapidly to 101° to 103° F., and falls by lysis about the third day. Severe frontal headache, flushed face, suffused conjunctivae; pain and tenderness in the eyeballs, back, calves of the legs, and epigastrium; anorexia and vomiting at times; constipation, but sometimes diarrhoea; slow pulse and leucopenia, are the chief symptoms. Second attacks are uncommon, hence the incidence is greatest among newcomers.

Similar febrile ailments had been reported in the records of our army and navy in the Mediterranean stations for nearly 100 years. They were attributed to solar influences, climate, intemperance, disorders of the digestion, and so forth, though in the Army Medical Report of 1853 doubt was thrown on these alleged causes, since such conditions existed elsewhere without fever arising.

On combining the successful experimental results of Austrian, English, and Italian investigators, it is found that (1) the subcutaneous injection of blood or serum withdrawn during the first twenty-four hours of sandfly fever, excited the disease nineteen times; (2) inoculation with the filtrate obtained by passing such diluted blood through a germ-proof filter induced the infection fourteen times;

(3) and that feeding experiments with infected sandflies were successful on twenty-one occasions.

Phlebotomus major (Annandale), called *P. perniciosus* by Newstead, is the common sandfly of Malta. *P. minutus* is widely distributed in sandfly fever localities; specimens of this variety have been sent recently by Captain Loughnan, R.A.M.C., from Aden, where for many years the infection has been prevalent among our troops; hence it is probable that both these flies transmit the disease in addition to *P. papatasii*. Marett found that the sandfly breeds in caves and in the interior of rubble walls in Malta. Howlett discovered them in heaps of bricks and other rubbish in India, and also in the damp algal muddy material from the sides of an open reservoir.

The existence of the phlebotomus and of the infection has been reported recently in Portugal, South of France, Italy, Corsica, Sicily, Greece, Palestine, Egypt, Soudan, Aden, Persian Gulf, Ceylon, Mexico, German East Africa, and India. In the Army Medical Report of the year 1911 it is stated that there were 1,393 admissions on account of sandfly fever among the European troops stationed in India. Phlebotomi have been captured in many parts of Europe, Africa, Asia, and in North, Central, and South America. Fuller details are given in the *Transactions* of the Society of Tropical Medicine and Hygiene, 1913, June, vol. vi, No. 7, pp. 243–256.

Sandfly fever occurs every summer year by year, but dengue breaks out in sudden epidemics at intervals of many years; hence the nature of the latter may not be recognized at first, since the local practitioners are often unacquainted with the disease. The outbreak in Calcutta in 1912 gave rise to a discussion as to the character of the infection on this account. In Malta there are annual summer epidemics of sandfly fever among our troops, but the last occasion on which they were attacked with dengue was in the year 1881. The rapid dissemination of the dengue infection throughout a community and the presence of rashes in about 70 cent. of the cases distinguish a dengue from a sandfly fever epidemic. No eruptions have been observed in the Maltese, Italian, and Chitral phlebotomus fever.

The causation of dengue has been investigated by Graham, Carpenter, and Sutton, and by Ashburn and Craig. Inoculation of healthy persons with the blood of dengue patients gave rise to dengue eight times. Inoculation with filtered infective blood induced the disease twice. Inoculation with the salivary glands of an infected culex originated the ailment once. Infection has been conveyed by infected culices eight times and once by an infected stegomyia. Graham protected families from dengue by mosquito netting. E. H. Ross extinguished epidemics of dengue in Port Said by exterminating the mosquitos. Stitt prevented the spread of infection from 200 dengue patients by enclosing them in mosquito-proof wire cages.

Blood withdrawn after the first day of sandfly fever is no longer infective, but the blood of dengue patients in the second to the fifth day of the fever excited the disease. Phlebotomi are unable to transmit sandfly fever until six days after feeding on a sandfly fever sufferer on the first day of his illness, but dengue has been conveyed by mosquitos immediately after sucking infective blood; and the virus survives in them for twenty-seven days. An attack of sandfly fever does not confer immunity against dengue, and vice versa.

The stegomyia was regarded by Legendre as the transmitter of dengue in a widespread outbreak at Hanoi in 1910. Davidson noted that this mosquito was present everywhere in Brisbane during the dengue epidemic of 1911. That there is some connexion between dengue and yellow fever has often been observed. In Bermuda in the year 1863 there was an autumn outbreak of dengue, which was followed by an epidemic of yellow fever. In Malta in 1881 both dengue and yellow fever attacked our troops.

There is a close resemblance between the sandfly, dengue, and yellow fever infections; they are all caused by a virus which circulates in the blood, and is able to pass through a bacteria-proof filter; the onset of the fever is similar in many instances, and during the first two days of the illness it may be impossible to distinguish between the ailments. Even later a diagnosis on clinical grounds may be unattainable, for atypical cases of dengue and yellow fever—and they are numerous—may bear every likeness to phlebotomus fever.

If we refer to Finlay's account of his classical experiments on the transmission of yellow fever, which have not always received the attention they merit on the part of subsequent investigators in this field (they were published in the *Journal of American Medical Sciences*, October, 1886, and September, 1891, and in the *Edinburgh Medical Journal*, 1894), we find that he induced attacks of fever which resembled dengue or sandfly fever in 14 out of 88 people who had been bitten by stegomyiae infected with yellow fever. He placed the mosquitos on the subjects of his experiment two to five days after they had sucked the blood of yellow fever patients in the second to the fifth days of their illness. The incubation period of the fever thereby set up varied from five to twenty-five days. The comparative mildness of the symptoms he evoked may be explained by the fact that the virus undergoes elaboration in the body of the stegomyia; the longer its stay the more potent it becomes. This was shown by the French and American commissions on yellow fever. The sting of a stegomyia fifty-seven days after it had sucked yellow fever blood induced a severe attack of yellow fever, whereas the bites of insects which had been infected for shorter periods, in several instances set up dengue-like illnesses.

It is now recognized that dengue and yellow fever occur sporadically. In Jamaica and Bermuda a dozen or so cases of short fevers are met with among our troops every year, in which blood cultures, microscopical and serological examinations are negative. In both these islands culices and stegomyiae are abundant, and phlebotomi are absent. It is probable that these febrile ailments are caused by mosquitos. The writer investigated six cases of fever in which the pyrexia lasted from five to ten days, in Malta before the advent of the sandfly season. In all, 5 to 10 c.cm. of blood remained sterile permanently; the serum reactions and microscopical examinations for parasites were negative; leucopenia and slow pulse were observed in every instance. Mosquitos were numerous, hence it is reasonable to suppose that they were the conveyors of the infection, since in every epidemic of yellow fever and dengue cases are numerous in which the symptoms are restricted to those above mentioned. He would name such attacks "mosquito fever."

DISCUSSION.

Dr. G. C. Low (London) said that the differential diagnosis of yellow fever from other diseases was not an easy one. Weil's disease, acute yellow atrophy, infectious and other jaundices, had all to be considered. Further, yellow fever might occur in a malarial individual, and this further complicated the diagnosis. The origin of sporadic cases of the disease had never been satisfactorily explained, and there were many points in the epidemiology of the disease still requiring solution.

Dr. FLEMING JONES (New Guinea) said that if he had to depend upon one symptom only in the differential diagnosis between yellow fever and other tropical fevers, he would rest upon the rising temperature and the falling pulse. He was speaking from the standpoint of an experience of many hundreds of yellow fever cases, and while he knew that there were many other important symptoms—still, that, in the speaker's mind, was the most important.

DISCUSSION ON FILARIASIS.

OPENING PAPER.

By GEORGE C. LOW, M.A., M.D., C.M.,
Lecturer, London School of Tropical Medicine.

IN opening this discussion I think it may not be out of place, first, to briefly review the literature of human filariasis for the past year—from July, 1912 to July, 1913. A considerable amount of work, some of it of a very interesting nature, has been accomplished in this time, and, though much still remains to be done, yet our knowledge of the subject as a whole has advanced considerably. Several papers dealing with the geographical distribution of *Filaria bancrofti*, *F. loa*, and *F. perstans* amongst the natives in the French possessions on the West Coast of Africa may be mentioned (Thiroux,[1] Cazanove,[2] Leger,[3] Morotte and Morvan,[4] and Ouzilleau[5]). Ouzilleau has

also studied the distribution of *Filaria volvulus* in the region of Mbomu, one of the two head waters of the Ubangi, a tributary of the Congo, and has suggested that this parasite may be a cause of elephantiasis in those regions. Such a statement cannot be accepted without confirmation and more definite proof than the author brings forward in his paper. It certainly does not appear to be a likely hypothesis.

As regards the filariae found in the South Sea Islands, Fülleborn[6] contributes a very interesting paper giving the results of his researches in those parts. His examinations showed that a very high percentage of the inhabitants of some of the islands of the Bismarck Archipelago and German New Guinea were infected with filariasis (*Filaria bancrofti*), and that the larval or embryonic forms in these areas, in contradistinction to those of Samoa, Fiji, and other places, possessed a well-marked periodicity. Why this should be so is very interesting, and will be referred to later.

Another paper[7] by the same author deals exhaustively with the morphology and differential diagnosis of the different human microfilariae. The points of distinction between the embryos of *Filaria loa* (filariologists are now agreed that Manson's *Filaria diurna* embryos are the larval forms of *Filaria loa*, and must therefore be known by that name) and *Filaria bancrofti* are well brought out, as are also the various anatomical structures of the embryos. Foley[8] has also contributed a paper on the same subject, having obtained his material for his studies from a detachment of Senegalese soldiers quartered in Algiers. Many of these were filariated, three species of filaria—*F. bancrofti*, *F. loa*, and *F. perstans*—being met with. By a series of tables and diagrams the differences between the larvae of the first two species are shown at a glance.

Next coming to diseased conditions produced by *F. bancrofti*, Low[9] has described in detail the pathology of a filarial chyluria case. At the autopsy it was found that the milky fluid which was passed during life and was present in the bladder after death was coming not from the thoracic duct, but from the lymphatics of the kidney and bladder. The condition was really a lymphuria, and hence not a proper chyluria, so the author has suggested the use of the term "filarial lymphuria" for such cases. Wise[10] has investigated various purulent conditions of the lymphatic system, and in conjunction with Minett has also studied filarial abscesses. Their observations make it clear that the filariae, by damaging the tissues, may allow the ingress of organisms, which in turn set up purulent foci, either localized, or, if the main lymphatics are involved, diffuse.

A fairly large number of papers on elephantiasis have also appeared. Kondoleon[11] and Rosanow[12] propose new operations for the treatment of this condition, while Madden, Ibrahim, and Ferguson[13] have pointed out that the operation of lymphangioplasty suggested by Handley fails to effect anything but a very temporary improvement in elephantiasis of the legs. Pelletier[14] and Müller[15] write on the operative technique adopted in elephantiasis scroti, the latter bringing forward some new modifications which he believes will prove useful in the ordinary operation. It is worthy of note that many of the cases of elephantiasis, on which the operations mentioned above were performed, were non-tropical ones, this indicating that the condition is commoner out of the tropics than is generally supposed, and may be due to some other cause than the filaria.

Filaria loa infections have had much study bestowed upon them. Leiper[16] has discovered the intermediate host of the parasite, finding that the development or metamorphosis of the embryos takes place in the salivary glands of *Chrysops dimidiata* and *C. silacea*. He has further obtained a slight and abortive development in *Haemapota* and *Hippocentrum versicolor*, genera allied to *Chrysops*, but all efforts to obtain infection in species of *Tabanus*, *Glossina Stomoxys*, *Cimicidae*, and *Culicidae* have failed. The development is very similar in nature to that which takes place in the embryos of *F. bancrofti* in the mosquito, fully metamorphosed specimens eventually appearing. These finally erupt from the gland in which they have developed, and then must make their way to the proboscis and so back to man, though this latter step has not so far been actually noted.

In addition to the work done upon the differentiation of *Filaria loa* embryos from those of *F. bancrofti*, Meinhoff[17] and Low[18] have followed up the clinical histories of cases and have added some very valuable information as to the length of time of the infection and the presence or absence of embryos in the peripheral blood. These points will be referred to again later.

Little has been done on the other filariae of man, namely, *F. perstans* and *F. demarquayi*, and no further advances have been made as to the respective intermediate hosts of these parasites.

As regards future work on *F. bancrofti*, the most promising path of investigation probably lies in the epidemiology, many important points still remaining to be cleared up. As regards the non-periodicity of the Fijian and Samoan filariae, Bahr[19] has suggested that this may be due to the habits of the intermediate host, *Stegomyia pseudoscutellaris*, which is a day-feeding mosquito. The solution of this problem does not appear to be one of very great difficulty; other islands must be examined and compared and the intermediate hosts determined, both in those in which the filariae are periodic in their habits, as well as in those in which they are not. Such an investigation must necessarily be a prolonged one, and will take up a considerable amount of time, but it should prove to be one well worthy of adoption.

Low[20] has already pointed out, for the West Indies, that the geographical distribution of *F. bancrofti* differs very greatly in many of the different islands; in Grenada, for example, practically none of the inhabitants being infected, although the conditions would seem to be perfect—climate, proper intermediate host present—for its spread. Here, again, there must be some factor present preventing the development of the parasite in its intermediate host, but what that may be is quite unknown. Low-lying flat places, such as British Guiana and Barbados, have very much heavier infections than the mountainous islands, such as St. Lucia, Grenada, and St. Vincent; but then, again, St. Kitts, which is mountainous in the interior, although its town (Basseterre) is flat, shows a very heavy infection, quite as heavy as that of British Guiana. Even in the districts and different parts of these islands, and far more so, of course, in the tropical regions of the different continents, this unequal distribution of the parasite may be met with. In some cases it may, of course, be due to the absence of the proper intermediate host, but in others, such as those I have just mentioned, that is not the cause. What it may be due to and why it should exist perhaps future investigators may be able to determine.

Further, the question of hyperfilariation is one worthy of consideration. Why, for example, should a person harbouring many filarial embryos in his own peripheral blood not be constantly reinfected by the mosquitos which he himself must be constantly and regularly infecting. One would have thought that in such instances hyperfilariation would have occurred, but apparently it does not. Does this mean there is a struggle for existence even amongst the filariae?

The constancy of the numbers of embryos in the peripheral blood for long periods of time is also interesting. For making accurate observations on these points, I have suggested that measured quantities of blood only should be used, and have myself taken 20 c.mm. as a standard quantity. Death of embryos must be constantly going on in the blood, as otherwise their numbers would become so excessive as to seriously interfere with the circulation. What becomes of them and where do they go? Possibly leucocytes may ingest them, but even granting this, it is not easy to see how the numbers destroyed should be so regular as to maintain a more or less average constancy amongst the number remaining. That they may all disappear, and that quickly, from the blood stream, is seen where lymphangitis and other inflammatory conditions kill the parent worms, or at least prevent the ingress into the blood of the young embryos. This would indicate that the life of the embryos in the peripheral blood is not probably a very long one, and soon comes to an end if the breeding females are removed. Against this view, however, are Fülleborn's interesting experiments of injecting uninfected dogs with the embryos of the dog filariae. These were recovered up to long periods afterwards, and were even found to have increased in length. Similar

experiments on monkeys with *F. bancrofti* embryos might prove useful.

More work is also required on the pathology and pathological anatomy of the diseased conditions produced by *Filaria bancrofti*. Investigations by Wise (loc. cit.) in British Guiana, and by Bahr (loc. cit.) in Fiji have helped us very much in this respect, and these observations, added to my own, all tend to show that this species of filaria is by no means a harmless parasite, but one that may be the starting point of the most serious pathological lesions.

As Bahr has pointed out, the destruction and fibrosis brought about by the presence of the worms in the lymphatic glands is a very real one, and certainly must lead to an increased difficulty of the passage of the lymph through those affected. In a paper of my own, already referred to,[9] I have tried to demonstrate that the blockage of the intra-abdominal glands which drain the lymph from the lower limbs is an easy one, and as these are a favourite site of the filariae, in my opinion this accounts for the frequency of elephantiasis of the legs. An accurate study of the lymphatic system is requisite, of course, to appreciate these points.

Death of the adult filariae seems to be a fairly common event, and when this occurs calcification of the remains is by no means an infrequent event. In other instances the dead body of the worm seems to act as a nidus for the growth of organisms, and then it may become the starting point of various septic and purulent conditions. In sections I recently made from calcified filariae taken from the neighbourhood of the hilum of the kidney one could see that the parasites were really contained in definite lymphatic vessels, the walls of which were enormously thickened and fibrosed. This again indicates a marked degree of toxicity even in a parasite, which, when death overtook it, became calcified, and this again indicates that these parasites act as irritants, setting up inflammatory changes, changes which are evidenced by small-celled infiltrations and final fibrosis. Probably none of them are harmless, and the degree of damage done will depend largely on the sites in which they are lying—that is, whether these are important or not.

These few remarks, then, indicate that much of interest still remains in the pathology and pathological anatomy of filariasis due to the *F. bancrofti*.

The same may be said of the symptomatology and pathology of *Filaria loa* infections. Here, though we have advanced enormously in the last few years, much still remains to be done.

One of the most peculiar features in many cases of *Filaria loa* infection is the prolonged absence of embryonic or larval forms from the peripheral blood, and this even although there is strong evidence of a fair infection with adult forms. I am now following up a series of such cases, and some little time ago published an interim report upon them (loc. cit.). A reference to this paper shows that some still have no embryos in their peripheral blood four years and even longer after their original infection.

One however does not give up hope of their ultimate appearance, as Meinhof (loc. cit.) has recently described a case where Calabar swellings appeared in 1905, then the first adult filaria was seen six years after that, and embryos appeared in the peripheral blood eight months after that—that is, almost seven years after the original infection.

This case, with Case v of my series—a patient who has been away from the endemic area for five and a half years, and yet has numerous *loa* embryos in his blood—indicates how long and protracted the infection may be.

Another point illustrated by Case v is that a patient may be infected and act as a carrier, and yet be unaware of this, none of the usual clinical signs of the disease having shown themselves. This is rare, but it leads one to ask what are the evidences of infection with *Filaria loa*. I have already entered into this in a paper on *Filaria loa* published in the *Journal of Tropical Medicine* in 1911, but for convenience may repeat what I wrote then here. "In coming to a diagnosis that a case is one of *F. loa* infection, four points should be attended to:

(1) The actual presence of the worm. Has this been seen or has one been extracted? If so, of course the diagnosis is complete.
(2) The presence of diurnal (*F. loa*) embryos in the peripheral blood.
(3) The actual presence or history of Calabar swellings.
(4) Eosinophilia with no explainable cause."

An examination of Case v's blood in the first instance would have shown a marked eosinophilia which would have made one suspicious. One would, on finding this, have examined the faeces and then the blood, and the embryos would have been found.

Personally I discovered the infection when really looking for embryos on the off-chance, as the patient had been in an endemic area. It is important to note, of course, that when eosinophilia is found with apparently no cause the night and day blood should both be separately examined. *F. bancrofti* must also be excluded.

I shall not enter here into the various theories that have been proposed from time to time to explain this peculiar absence of embryos—males only present, immature females, and so on. The hardest to explain are undoubtedly the cases where adult female filariae full of embryos have been removed from the eye or other tissues and yet no embryos were found in the peripheral blood.

Points in the pathology of *Filaria loa* infections also require clearing up. We do not know, for example, why the worms cause the peculiar fleeting swellings generally known by the name of Calabar swellings. Sir Patrick Manson's idea was that they might be due to the mature female giving birth to a brood of young embryos, and this may be so. His experiment of drawing off serum from one of these swellings, and finding embryos in it, was vitiated of course by the fact of the patient having embryos in the blood at the same time. On account of this one cannot be sure that he had not taken blood up when introducing the needle into the swelling. This experiment will have to be repeated on cases of Calabar swellings with no embryos in the peripheral blood—quite a common occurrence.

The presence of *Filaria loa* in the system produces a very marked eosinophilia, quite as much or even more marked in some cases than that produced by *F. bancrofti*. The whole subject of helminthic eosinophilia is one requiring close attention, and it should form a very interesting piece of research work for some young and active investigator.

Another point of interest is that *F. loa* does not seem to produce abscesses like its neighbour *F. bancrofti*. What becomes of the former when it dies? Is it always aseptic and simply absorbed?

As regards *F. perstans* and *F. demarquayi*, work for the future includes the findings of the intermediate hosts of these parasites. Wellman has incriminated the *Ornithodorus moubata* as a host for the former, but so far no one has confirmed this.

Filaria volvulus, now called *Onchocerca volvulus*, is a parasite about which we know very little. Its life-history is quite unknown. How it gets into man and how out of him is a mystery. Ouzilleau's work on the subject has already been mentioned, and his idea that the parasite may have something to do with the production of elephantiasis is one, as I have said, that requires accurate confirmation.

I think I have shown, then, in these somewhat brief remarks, that there is a fruitful source of investigation awaiting anyone who wishes to take up the subject of human filariasis, and I hope that what I have said may be the means of stimulating a very interesting discussion on the subject now.

REFERENCES.

[1] Thiroux, A.: Les Filaires Embryonnaires du Sang des Indigènes de l'Afrique Occidentale Française. *Bull. Soc. Path. Exot.*, 1912, June, vol. v, No. 6, pp. 438-445.
[2] Cazanove: Considérations sur la Filariose dans le Bataillon des Troupes Noires d'Algérie (1910-1911). *Ann. d'Hyg. et Méd. Colon.*, 1912, July-August-September, vol. xv, No. 3, pp. 555-593.
[3] Leger, André: La Filariose Humaine dans le Haut-Sénégal et Niger, Index Endémique de la Région de Bamako. *Bull. Soc. Path. Exot.*, 1912, October, vol. v, No. 8, pp. 618-622.
[4] Marotte and Morvan: La Filariose au Bataillon de Sénégalais d'Algérie. *Arch. de Méd. et Pharmacie Militaires*, 1913, January, vol. lxi, No. 1, pp. 1-66.
[5] Ouzilleau, F.: Les Filaires Humaines de la Région du Mbomou (Afrique équatoriale française), Pathogénie de l'Eléphantiasis de cette Région. Role de la *Filaria volvulus*. *Bull. Soc. Path. Exot.*, 1913, January, vol. vi, No. 1, pp. 80-88.
[6] Fülleborn, F.: Über Mikrofilarien des Menschen im deutschen Südsee-Gebiet und deren "Turnus," nebst Bemerkungen über die klinischen Manifestationen der dortigen Filariasis. *Arch. f. Schiffs- u. Trop. Hyg.*, 1912, August, vol. xvi, No. 1, pp. 533-547.

[7] Fülleborn, F.: Beiträge zur Morphologie und Differentialdiagnose der Mikrofilarien. Beihefte zum *Arch. f. Schiffs- u. Trop. Hyg.*, 1913, January, vol. xvii, Beiheft 1, pp. 7–72.
[8] Foley, H.: Etudes Morphologiques sur les Microfilaires à Gaine (*Mf. Bancrofti* et *Mf. Diurna*). Observations faites chez les Tirailleurs Sénégalais d'Algérie. *Ann. Inst. Pasteur.* 1913, January 25th, vol. xxvii, No. 1, pp. 50–68.
[9] Low, George C.: A Note on the Pathology of Chyluria. *Journ. London School of Trop. Med.*, 1912, July, vol. i, No. 3, pp. 243–250.
[10] Wise, K. S.: Report of Tropical Diseases Research in the Government Bacteriological Laboratory, British Guiana, for the Six Months, April, 1912, to September, 1912.
[11] Kondoleon, Emm.: Die operative Behandlung der elephantiastischen Ödeme. *Zentralb. f. Chir.*, 1912, July 27th, vol. xxxix, No. 30, pp. 1022–1025.
[12] Rosanow, W. N.: Lymphangioplastik bei Elephantiasis. *Arch. f. klin. Chir.*, 1912, vol. xcix, No. 3, pp. 645–655.
[13] Madden (Frank Cole), Ibrahim (Aly), and Ferguson (A. R.): On the Treatment of Elephantiasis of the Legs by Lymphangioplasty. British Medical Journal, 1912, November 2nd, pp. 1212–1214.
[14] Pelletier, J.: Cas d'Eléphantiasis du Scrotum observés au Sénégal, *Bull. Soc. Path. Exot.*, 1912, October, vol. v, No. 8, pp. 625–627.
[15] Müller: Zur Operation der Elefantiasis der Männlichen Genitalien. *Arch. f. Schiffs- u. Trop. Hyg.*, 1913, vol xvii, No. 8, pp. 269–272.
[16] Leiper: Personal Communication.
[17] Meinhof, Heinrich: Zur Klinik und Morphologie der Filaria und Mikrofilaria loa (diurna). Beihefte zum *Arch. f. Schiffs- u. Trop. Hyg.*, 1913, February, vol. xvii, Beiheft 2, pp. 5–58.
[18] Low, George C.: Filaria loa Cases, Continuation Reports. *Journ. Trop. Med and Hygiene*, 1913, April 15th, vol. xvi, No. 8, pp. 118–120.
[19] Bahr, P. H.: Filariasis and Elephantiasis in Fiji. A Report to the London School of Tropical Medicine, 1912.
[20] Low, George C.: The Unequal Distribution of Filariasis in the Tropics. *Trans. Soc. Trop. Med. and Hyg.*, 1907–8. vol. i, p. 84.
[21] Low, George C.: Filaria loa. *Journ. Trop. Med. and Hyg.*, 1911, January 2nd.

DISCUSSION.

Dr. Duncan Whyte (Swatow, China) confirmed the views of Dr. Low as to the absence of hyperfilariation. Patients in whom the number of microfilariae in 20 c.mm. of blood had been counted at a certain hour of the night showed no increase in that number five or six years later, although there seems no reason to doubt these persons had been often bitten, during the intervening years, by mosquitos whom he had himself infected. Dr. Low had given no definite information as to the duration of life of microfilariae in the blood stream, and Dr. Duncan Whyte thought it worth while reporting that (in three filariasis patients from whom elephantiasis scroti had been removed) the microfilariae could be found in the peripheral blood for from a week to ten days afterwards. The "patchy" distribution, both of filariasis patients and of elephantiasis cases, to which Dr. Low had drawn attention in the West Indies, had also been found in different parts of South China. The reason for this still awaited discovery. It was a verdict of "not proven" that should be brought in on the question of the possible pathogenicity of the *Filaria bancrofti*. It seemed very probable that this filaria was the cause of elephantiasis, but the arguments used to prove this were of the same kind as those that were used ten years ago in an endeavour to incriminate *Filaria perstans* as the cause of sleeping sickness. The discovery of trypanosomiasis as the cause of this condition had shown that *Filaria perstans* must be exonerated. An open mind must be preserved, lest the discovery of some other cause of elephantiasis should be missed.

Dr. R. Fleming Jones (New Guinea) remarked that a point which had often occurred to him in connexion with elephantiasis and filariasis, and which had been mentioned by Dr. Duncan Whyte, was the patchy distribution of elephantiasis. In British New Guinea he found an average of 7 per cent. of blood infection with microfilariae (*F. bancrofti*), and yet he got nearly all his cases of elephantiasis from one small district. The suggestion of symbiosis at once occurred. Something more than filarial infection alone would seem to be indicated.

Dr. P. H. Bahr (London) gave a demonstration of specimens collected in Fiji, first dealing with the occurrence of the mature parasite in the tissues, its fate therein, and secondly, with the development of the filaria in the mosquito. He stated that adult filariae were found most commonly in Fiji in the lymphatic glands. He had put out for exhibition a male and a female specimen, which had been determined by Dr. Leiper as typical *F. bancrofti*. In the glands in which adult filariae occurred several changes were noted; these were shortly (1) giant cell formation and (2) fibrosis. He did not think the irritative effects of these parasites on lymphatic tissue was sufficiently realized. They appeared to exert this effect in a two-fold manner—first, by their presence as a foreign body, and, secondly, by the toxin and by excreta. It was probable that in the natural course of events the filaria living in the abdominal lymphatics and glands caused no acute symptoms, and after its death became calcified. Its calcified remains, again, acted as an irritant, and further increased the amount of fibrosis. These calcified filaria had now been found commonly in almost every lymphatic gland of the body, the testes, epididymis, and tunica vaginalis; and, curiously enough, they were common in the lymphatics of the kidney substance and the perirenal fat. Their effects on lymphatic vessels were also marked; blockage in these could take place in three ways: first, by mechanical blockage; secondly, by surrounding fibrosis; and, thirdly, by a proliferative process of the endothelium of the vessel wall. These gland changes were seen not only in the glands inhabited by filariae, but also in lymphatic glands in the course of the lymphatic stream. In these glands were also found marked giant cell formation and fibrosis, and also by areas of hyaline tissue, which was probably stagnated lymph. Lymphatic tissue so extensively damaged was much more liable to secondary invasion by septic organisms, and even by the tubercle bacillus itself. Filarial abscesses, of which the filaria was the primary and the streptococcus and staphylococcus the secondary cause, were extremely common in Fiji, and such cases had been lately described by Wise and Minett in British Guiana. As for the pathology of lymphangitis, it was a local disturbance, and microfilariae were found in the gland substance in the immediate proximity; the lymph abstracted was generally sterile. Some specimens he exhibited showed the extraordinary degree of development attained by the microfilariae of Fiji; no periodicity took place in its intermediary host, *Stegomyia pseudo-scutellaris*, while other specimens showed that the larval forms died out in *Culex fatigans*, when these were fed simultaneously under exactly the same conditions. In *Culex fatigans* a very few developing filariae lived to enter the proboscis. *Stegomyia pseudo-scutellaris* was a day-biting mosquito, and the lack of periodicity of the embryo in the blood of man seemed to be a distinct adaptation of the habits of its favourite intermediary host—*Stegomyia pseudo-scutellaris*. The mode of development agreed in the main with that described by Low, James, and others. In reply to questions, the speaker added that the irritant effects of filaria on tissues was probably local and general. In response to the general toxaemia a general eosinophilia was produced, and disappeared when the filarial infection ceased. Lymphangitis came on periodically because the filaria had definite breeding seasons and the emission of microfilariae only took place at definite periods, causing the lymphangitis. The patchy distribution of filariasis was well marked in Ceylon. Perhaps the chemical composition of the water in which the mosquitos are bred had something to do with the capacity of the mosquito for acting as intermediary host. Humidity and temperature had a great influence on the rate of development. In Fiji in the cold weather the cycle in the mosquito took three weeks, in the hot weather only ten days. Microfilariae disappeared from the blood after an attack of lymphangitis; this fact explained the absence of microfilariae from the blood in cases of marked filarial disease. Besides this fact many adults (as many as twenty-four) were found in the lymphatic gland without corresponding presence of microfilariae in the blood.

Professor Wasielewski (Heidelberg) suggested that a chemical effect might be produced by the filariae, and have something to do with the lesions present in filariasis.

Dr. Cameron Blair (Nigeria) referred to the periodical attacks of filarial fever, and to lymphangitis. Dr. Bahr believed this was due to definite breeding season for the parent filaria and the birth of young embryos set up the lesion.

Dr. Malcolm Watson (Malay States) referred to the "patchy" distribution of filariasis, and mentioned that Dr. Bahr had suggested that the chemical composition of the water in which mosquitos bred might have something to do with it. If so, this was analogous to *Anopheles* carrying or failing to carry malaria infection, as pointed out by Christophers.

Dr. LOW, in replying to the discussion, said that he would deal with the many interesting points raised seriatim. He had noted the same thing as mentioned by Dr. Duncan Whyte as regards the infection occurring in families—namely, some members heavily infected, others not. As regards the etiology of elephantiasis, this was a subject that had always given rise to much discussion. Personally, he believed the filaria was the primary cause, though he admitted that other causes might act. Gonorrhoea, for example, was the chief cause of stricture of the urethra, though traumatism could equally well cause it, and this should be remembered. Many of the opponents of the filarial theory for elephantiasis had not studied the anatomy of the lymphatic system in detail, and he referred them to a recent paper of his own on chyluria. Why the Fijian microfilaria did not develop well in *Culex fatigans* he could not say. It certainly did in China, the West Indies, and Australia. Dr. Bahr's theory of adaptation of the parasite to the intermediate host habits, though interesting, was not absolutely conclusive. In *Filaria minutis* of the dog the microfilariae were present in the blood by day as well as by night, though the carrier was a night feeder. Professor Wasielewski's suggestion of a chemical effect being produced by the filaria, and having something to do with the production of the lesions, was a very interesting one, and probably a correct one. Answering the remarks of Dr. Malcolm Watson, Dr. Low commented on the absence of malaria in Barbados, and gave an explanation of it. Anophelines and other mosquitos also acted as hosts, as as well as *Culex fatigans*. Salvarsan had been used in the treatment of filariasis, but so far as he (Dr. Low) knew, was of no use. Answering Sir William Leishman, Dr. Low said that he believed the adult female *Filaria loa* removed were fertilized, thus indicating that males were present. Temperature and humidity were of the greatest importance in the development of the filaria in the intermediate host.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

A COMMENT ON TWO RECENT ARTICLES ON HELMINTH INFECTIONS IN MAN.

To the October issue of the *Practitioner* Mr. J. A. Kay contributes an article entitled "A New Ovum and its Miracidium," based upon a case of urinary bilharziosis in South Africa. Associated with numerous typical terminal-spined schistosome ova were other oval bodies $\frac{1}{500}$ in. by $\frac{1}{750}$ in. containing embryos. These bodies are believed by the author to be ova and miracidia of a new trematode. From the figures and description given I have not the slightest hesitation in affirming that the bodies do not bear the slightest resemblance or relation to either ova or miracidia of a trematode. They are certainly not even of helminthic origin. The case is one of accidental parasitism of the bladder by an infusorian or is another instance of faulty technique. The figures and portions of the description might best be accounted for perhaps by the presence of *Rotifers* in the water used to dilute the urine.

In the BRITISH MEDICAL JOURNAL this year there is recorded an apparently indigenous case of filariasis in Devon. As this would have been the first occurrence in Britain, and consequently a record likely to become extensively quoted, I obtained some slides from the author. The "filariae" are minute filaments of cotton-wool which have contaminated the freshly-made blood films. It is to be hoped that the above cases will not find their way into the textbooks. "*Filaria gigas*" is a familiar instance of the manner in which such records may thus become stereotyped, in spite of repeated repudiation by workers on helminthology.

R. T. LEIPER, D.Sc., M.B., F.Z.S.
London School of Tropical Medicine.

FATAL PURPURA FOLLOWING SCARLET FEVER.

THE interesting case of fatal purpura following scarlet fever reported by Drs. Biernacki and Dykes in the JOURNAL of October 11th, p. 903, is probably an example of the type to which Henoch gave the name of purpura fulminans. I say probably, because though the case corresponded to Henoch's description in the rapidity of ecchymosis formation, entire absence of haemorrhages from the mucous membranes and rapidly fatal course, an absence of haemorrhages in the internal organs which was characteristic of Henoch's cases, could not be verified owing to the lack of an autopsy.

It is a remarkable fact that of the 65 cases of purpura fulminans now on record 18 have followed scarlet fever. Two examples of purpura fulminans have recently been published, one by Dr. T. McCririck and myself conjointly,[1] and the other by Dr. McCririck alone.[2] In our conjoint case the recent occurrence of scarlet fever was possible though not certain, and in Dr. McCririck's case the purpura developed in the third week of a mild but undoubted attack of scarlet fever. In both our cases, as in Henoch's, nothing was to be found *post mortem* but marked anaemia of all the organs. Both resembled the case of Drs. Biernacki and Dykes in the inflammatory character of the purpuric areas and the appearance of threatening gangrene as well as in the preservation of mental faculties until the end. The blood count differed considerably in each case.

Grove Hospital, S.W. J. D. ROLLESTON.

Reports

ON

MEDICAL AND SURGICAL PRACTICE IN HOSPITALS AND ASYLUMS.

NORTH-EASTERN HOSPITAL, TOTTENHAM.

A CASE OF SPONTANEOUS FRACTURE OF RIBS IN A TUBERCULOUS INSANE PATIENT.

(By J. B. SLATTERY, M.D., Assistant Medical Officer, Metropolitan Asylums Board.)

For the reasons stated at the end, the following case seems worth placing upon record.

The patient, an imbecile aged 23, was a fairly well-nourished, strongly built, though undersized individual, with a well-shaped thorax, who was treated in bed for pulmonary tuberculosis. There was breaking down of both upper lobes, with much secondary infection and irregular temperature.

One day he had an alveolar abscess in the left lower jaw. There was external swelling, which increased after extraction of the tooth and was incised. Some days later another abscess swelling appeared lower down in the neck, and then still another, with one over the parotid. Owing to the character of the patient treatment was difficult. But these abscesses healed.

The following week another abscess swelling appeared in the lower lumbar region. It was superficial, and healed after incision. The temperature remained very irregular, however, and the patient became distinctly more ill and weaker.

One morning eleven days later he complained of pain in the chest, indicating the lower ribs on the right side. On examining him I found the sixth and seventh ribs on the right side broken just outside the nipple line. There was slight swelling and no bruising. Next morning, on again examining the chest, the seventh, eighth, and ninth ribs on the left side were found broken at almost exactly corresponding points. On the right side the swelling had increased and extended below the ribs, while on the left side slight swelling only could be noticed. There was no other external sign. Injury due to any roughness in handling or to other external cause could be absolutely excluded. He was continuously under observation, and had trustworthy nurses. He got rapidly weaker and died in a few days.

Post-mortem Examination.

The conditions in the heart, lungs, and pleurae were only such as might be due to the tuberculous and secondary lung infections. In the pleurae there were some adhesions, but these were not recent. But there was some recent peritonitis, and outside the peritoneum, between the spleen and the ribs, was a collection of pus and clotted blood. On the right side of the chest the sixth, seventh, and eighth ribs were eroded at points about 1½ in. from the junction with the rib cartilage and the sixth and seventh were broken. Pus had tracked downwards between the abdominal muscles and formed a collection in the abdominal wall external to the peritoneal cavity. On the left side the seventh, eighth, and ninth ribs were eroded and broken, and the sixth had an eroded area with a small collection of pus between it and the skin. In the right kidney were a few minute abscesses, but in no other part could I find any collection of pus, nor, indeed, any coarse lesion that had not existed for some time. There was nothing further in the case that need be mentioned here.

[1] *Brit. Journ. Child. Dis.*, 1910, vii, p. 58.
[2] Ibid., 1912, ix, p. 154.

Apart from any clinical interest in the facts, it may be desirable to have such cases on record. This will be more obvious to those familiar with the medical work of institutions, and particularly of institutions with insane patients, in most of which, probably, the fractured rib is a dreaded source of trouble. As a matter of fact, the occurrence in an institution recently of an obscure case, possibly of similar nature to the above, and in which, as one would expect, the question of trauma arose, impels the publication of this brief note, though it refers to a case not recent.

Reports of Societies.

EDINBURGH MEDICO-CHIRURGICAL SOCIETY.

At a meeting on November 5th, Dr. John Playfair, President, in the chair, Dr. Ninian Bruce, in a paper on *The suprarenal glands*, said the action of adrenalin was to stimulate the myo-neural junctions of the sympathetic nerves, also the heart, and the various secreting glands of the body. Its primary function was thus to maintain cardio-vascular tone. The development of these adrenalin-secreting cells was from the same primitive nerve cells, which became the nerve cells of the sympathetic ganglia; the two sets of cells were thus closely related both in their development and in their function, but the chromaffin cells were predominant, as was shown by the fact that removal of the suprarenals was always fatal, while section of the entire sympathetic (as could be done in the cat) was not so. Prolonged stimulation of the splanchnic nerves of the sympathetic produced a temporary exhaustion of adrenalin in the suprarenals. With regard to the pathology of the glands, this had hitherto been largely concerned with Addison's disease, but it was now being recognized that in many other diseases the functional efficiency of the suprarenals was an important factor—as, for example, in acute infective conditions—in poisoning by vegetable and metallic irritants, and in physical conditions such as fatigue. He suggested that cases of sudden death in diphtheria were due to a complete, though possibly only temporary, exhaustion of the suprarenals, and that the asthenia in influenza, typhoid fever, etc., might be due to a less grave degree of inadequacy. Addison's disease was the most chronic of all suprarenal affections, but in some cases it was much more acute than in others. He cited one case which was rapidly fatal, in which pigmentation developed in eleven days from the onset of asthenia, and another, which ran to a fatal end in three days without the appearance of any pigmentation, in which one suprarenal was completely caseous, while the other was healthy. Cases of sudden death in exophthalmic goitre, after operation on the thyroid gland, might be due to a superposed inadequacy of the suprarenals. The treatment of these different types of suprarenal exhaustion by adrenalin was a difficult problem. The action of adrenalin was only temporary, and its exhibition would require to be continuous where the suprarenal inadequacy was persistent. Dr. Byrom Bramwell said that in 1876 he had reported a case of Addison's disease, produced by destruction of one suprarenal body. In cases of Addison's disease without suprarenal disease he favoured the view that lesions in the semilunar ganglia or extensive caseation of the mesenteric glands might be the cause. Cases of Addison's disease without pigmentation occurred, just as in fevers the skin eruption might be absent. He was doubtful as to the case of acute Addison's disease with a course of three days, as described by Dr. Bruce. Symptoms of asthenia had probably existed for some time previously. He was not convinced by the suggestion that sudden death in diphtheria was due to an acute and complete suprarenal exhaustion. He did not agree with the view that the pigmentation occasionally present in cases of exophthalmic goitre was due to and was a sign of suprarenal inadequacy. Professor Caird said that in two recent cases where subcutaneous salines were being given, he had added adrenalin to the solution, and was satisfied that benefit had accrued. Dr. Claude Ker said he was chiefly interested in the prospect of adrenalin rendering service in heart failure during diphtheria. In his hands it had failed by whatever method of administration tried, no doubt because a continuous action was not obtained. He would try the method suggested to Dr. Bruce by Sir Lauder Brunton—injection high up in the rectum. He, like Dr. Bramwell, was sceptical as to the dominant part ascribed to the suprarenals in heart failure in diphtheria, and referred to the gross lesions that were present both in the heart muscle and the nerves. Dr. Berry Hart suggested transplantation of suprarenals as a means to secure a permanent additional supply of adrenalin. Dr. Aitchison Robertson suggested feeding with the gland as a means of administration.

ROYAL SOCIETY OF MEDICINE.

Section of Ophthalmology.

At a meeting on November 5th, Sir Anderson Critchett, President, in the chair, the President made sympathetic reference to the death of Mr. Edward Nettleship; it had brought a loss not only to the society, but to the world of ophthalmology. Mr. G. Coats, in a paper on *Disease in the animal eye*, described a form of keratitis characterized by the presence of a superficial vascular opacity in the cornea. It was of long duration, and had no evident association with distemper or other general illness. It sometimes occurred in more than one member of the same litter. The human condition which it most nearly resembled was trachomatous pannus. In a case of retinal degeneration following distemper the changes were peculiar in that the bipolar cells of the inner nuclear layer were chiefly affected. They were probably due to the presence of a circulating toxin with a specific affinity for the retinal bipolars, analogous to the specific action of nicotine on the ganglion cells. Examples of choroido-retinal degeneration in a dog, raccoon, wolf, wild sheep, ferret, wallaby, and hyaena were shown. The raccoon appeared to be an albino, yet a little pigment was present in the epithelium of the ciliary body and anterior part of the choroid, showing that pure albinism could not be diagnosed without a microscopical examination. The raccoon also showed nystagmus, a condition occasionally described in the lower animals. A case of choroiditis, cyclitis, and keratitis in a bear, and one of anterior choroiditis in a peccary were also illustrated. Two instances of canine irido-cyclitis were reported. The first was of plastic type, and was peculiar only in its occurrence in the dog, in which animal the condition appeared to be rare; the second, also in a dog, was characterized by an enormous thickening of the iris, due to infiltration with mononuclear cells of a special type. Posterior synechiae and other features of plastic iritis were absent. The cause of the irido-cyclitis was obscure in both instances. Mr. Charles Wray, in a paper on *Obstruction of the lacrymal duct and its treatment*, said it was a mistake to remove the sac when syringing failed without attempting to cure by means of styles, or styles and probing combined. It was not unlikely that ectropion and its sequelae might follow excision. Too much was heard of the satisfactory and immediate results, but too little of bad ones and of recurrences. The author treated his cases in the following way: He injected cocaine by Mellen's method, and instilled a drop into the conjunctival sac. A Bowman's probe was then passed into the sac, and the point pushed forward under the palpebral ligament. He then cut down on the guide, taking care to note the click of the knife on the probe. So far the procedure was quite painless. He then placed crystals of novocain in the sac, and had recourse to probing. At times, if the stricture was impermeable, he forced a passage through the posterior wall of the duct. A piece of strapping was then placed just below the sac, so that the style when introduced did not press on the skin. A special style—gold-plated, and obtainable from Courlander, of Croydon—was then passed; and the latter was so constructed that when a piece of strapping was placed on its arms it could not move. Whilst it was *in situ* argyrol, 5 per cent., was used three times a day, or such other application as might be desirable. Later, when a firm-edged fistula had formed, the patient was instructed to irrigate the sac three times a day, passing the style at night and taking it out in the morning. To cure the fistula it could be dilated, and, whilst stretched, all the cicatricial tissue cut away, after which the edges of the wound were brought together and covered with collodion.

HALIFAX AND DISTRICT MEDICAL SOCIETY.

AT the first meeting of this society, on October 20th, Dr. HUGHES, the newly-elected President, said it was very difficult in ordinary practice to collect the necessary material for a presidential address. He had no startling cure to describe in either medicine or surgery. Though it was more usual to describe one's triumphs in practice, it was often more profitable to reflect on failures or mistakes. Cases often remained undiagnosed through neglect to make careful examination. Such cases were liable to drift to other practitioners, who, by examining the urine, the chest, or the ears, or one or other of the organs, were able, having arrived at a definite diagnosis, to supersede the mere "rep. mist." line of treatment. It was their duty to do for those who confided in them all that they should clamantly demand for themselves in similar circumstances. Cases of young children about 5 years of age complaining of pain in the hip and legs might be cited as an example. They could walk fairly easily and bend the joints painlessly. The diagnosis too often was rapidly decided—"growing pains" or rheumatism. The careful man, however, stripped the child and found commencing curvature of the spine. Rest in bed and a Sayre's jacket would then be advised, with almost certain success. Such cases cropped up in practice after prolonged treatment or non-treatment at other hands. Another type of case, also connected with the spine, was liable to be mistaken for rheumatism if clinical examination were deficient—the case, for example, of a person, generally about 18 years of age, complaining of a stiff neck and some difficulty in swallowing. A casual examination of the throat revealed nothing, but a proper examination with good illumination and the aid of the finger would reveal a bulging forwards of the posterior pharynx; thus this "rheumatism" turned out to be disease of the cervical vertebrae with a retropharyngeal abscess. Another easily avoidable mistake might occur in the case of old people with chronic "winter bronchitis." Such persons turned up year by year—they were told to "wait till spring," and left the surgery with a supply of chlorodyne, ammonium carbonate, and squills. On some occasion they did not improve, and this was explained as due to their growing older, but the application of the stethoscope would have disclosed indications of one or both sides of the thoracic cavity being full of fluid. Passive effusion was liable to be overlooked if the patient could go about or did not have any pain, yet the cough and breathlessness were due to the patient gradually becoming waterlogged. Again, there were cases in which a patient had been known to be treated for many years for "the change," the abdomen not having been examined. Another opinion was taken and a huge ovarian tumour removed. It was never safe to rely on a patient's own diagnosis; it generally led to disaster and confusion. With some patients anything wrong about the anus was called "piles." On the patient's diagnosis cases had undoubtedly been treated by the familiar remedies for piles, whereas a complete examination subsequently disclosed fistula, or fissure, or even carcinoma. A woman of any age who had unaccountable nausea and vomiting, especially on Mondays and Fridays—days usually dedicated to washing and cleaning up—should be examined for a displacement of the uterus. An obstinate tickling cough could often be cured by taking the precaution to examine the ears for wax and removing it if present. A minute's use of the stethoscope would save many errors in diagnosis, and indicate the right lines for treatment. Simple explanations were missed for want of similar care in observation. In quite young children just starting school, otherwise unaccountable epilepsy could often be cured by the use of spectacles. The case of a call to a child in the night might be taken: the doctor was told that this child was in a fit, that it was "mad over schooling," and "all its larnin' goes to its 'ead." If it were ordered to be kept from school for a time the fits ceased, but soon reappeared when school was resumed. Such cases were often due simply to eyestrain, but for want of a sufficient examination the condition was not relieved. How often did the doctor examine a patient's urine in a case of carbuncle? Local treatment was adopted, the carbuncle recurred, and later an examination of the urine settled the unsuspected cause—diabetes. Again, if a pregnant woman continued with the usual sickness after the third month, it was always wise to examine the urine. This sickness was often ascribed to the pregnancy, also even the oedema of the legs, when actual nephritis was the cause. The precaution of examining the urine was calculated at times to save life.

NOTTINGHAM MEDICO-CHIRURGICAL SOCIETY.

AT a meeting on November 5th, Mr. R. G. HOGARTH, in a presidential address, gave an account of some medical men who had practised in Nottinghamshire in early days. One of them was John Arden, who practised at Newark from 1349 to 1370, and eventually became the King's surgeon. He was renowned for his treatment of fistula in ano. Another was John Jones, of Aspley Hall, who in the sixteenth century drew attention to the value of Buxton water. Robert Thornton and Charles Deering were other renowned doctors, though their fame rested more on their work as historians than as medical men. Nottingham boasted of another physician appointed to royalty—in Dr. Taylor, who was physician to George II. The foundation stone of Nottingham General Hospital was laid by John Smelley in 1781. It was opened in 1782 with 44 beds.

MEDICO-PSYCHOLOGICAL ASSOCIATION.

AT the autumn meeting of the Northern and Midland Division of the Medico-Psychological Association of Great Britain and Ireland, on Thursday, October 23rd, Dr. J. F. DIXON in the chair, Dr. T. ARNOLD JOHNSTON, in a paper on the position of *Pathology in mental hospitals*, dealt with the relation of the medical superintendent and the medical officers to laboratory and research work and to the ordinary routine duties of an asylum. The "incubus of routine," he thought, stifled ambition, and the medical officer needed encouragement and training to obtain his help in laboratory work. The pathological department ought to cover ordinary sick-room work as well as special mental hospital conditions. There was need of a system of educating and interesting the medical officer; of a series of centres for the higher technical forms of laboratory work, and of an interchange and collating of proved research facts and their application to treatment. A paper by Dr. MACPHAIL, on the *Cerebro-spinal fluid*, which was read in his absence, dealt with the results of an estimation of the amount of albumin in the cerebro-spinal fluid derived from a series of cases of various forms of mental disorder. The observer used 5.5 c.cm. of the fluid diluted with an equal quantity of water—the fluid being obtained by lumbar puncture. The amount of albumin present was found to vary within wide limits, the lowest being 0.03 per cent. and the highest 0.3 per cent. General paralysis always showed an increase. He considered the test of value in all classes of mental diseases, and had found that the greater the amount present the more serious was the prognosis of the case.

IN the sixth annual report of the council of the Society of Tropical Medicine and Hygiene it is stated that during the year 1912 and to the end of the financial year ending March 31st, 1913, the society has continued to prosper, and great interest has been shown in the papers communicated, all of which have resulted in interesting discussions. During the year 64 candidates were admitted as Fellows, making the total 787 since the formation of the society. As a result of deaths and resignations this number has, however, been reduced to 608, at which it at present stands. The treasurer's report is also very satisfactory, showing a substantial balance for the year under discussion.

A DUEL of a somewhat unusual kind has recently been fought in France. A journalist had said that Toulon was an active centre of opium eating, and that this vice was general in the navy. This sweeping accusation was vehemently denied by a medical officer of the navy, Dr. Rapuc, who in the course of his rebuttal said: "To treat as a national danger a vice which is peculiar to some snobs and degenerates is not to do a service to the French navy, but to discredit it." The journalist responsible for the charge challenged the doctor, and after eight bouts was badly wounded in the wrist. For a French duel this was a severe encounter, and it is evident that the accusation was keenly felt. We hope the French navy is duly grateful to its medical champion.

Reviews.

SIR FELIX SEMON'S COLLECTED WORKS.

In Sir Felix Semon's *Forschungen und Erfahrungen, 1880–1910*,[1] we have in two handsome, well-bound, and well-printed volumes the *opera omnia* of one who is acknowledged by his confrères in all countries as a *maestro di color che sanno*. The reading of these interesting tomes brings back the memory of already half-forgotten, far-off things and battles long ago, when this doughty wielder of the laryngeal mirror and the pen was wont to drink delight of battle with his peers. Sir Felix Semon, with his well-known frankness of character, would be the first to acknowledge that he agreed with Browning's hero who exclaimed, "I was ever a fighter," for the motto he has himself chosen to put at the head of his work is "Leben heisst ein Kämpfer sein."

Those were strenuous days at the end of last century, when we were wont to pronounce each other orthodox by apostolic blows and knocks, but we must remember that when Sir Felix took up the special department of laryngology it was the despised Cinderella of the medical sciences, and that it required as a champion one who shared Charles Kingsley's dictum that any life which is not a struggle is not worth living. How valiantly the cause of laryngology was espoused by Semon has been testified to by many authorities on many occasions. Amongst others Dr. McBride, in delivering the first Semon Lecture, states that "partly by his writings, but chiefly by his personality, he has done more in the public service of laryngology than any other man living or dead—Garcia, Türck, and Czermak possibly excepted."

It must not be for a moment thought that these collected works are all or chiefly of a disputative character. It is only intended to suggest that, in maintaining his own views, Semon does so with a vigour and a tenacity which we can but admire, especially as the present generation appear to have fallen on days where there is less contest—shall we say, less enthusiasm?

These two volumes will form part of the library of the laryngologist for all time. Everything in them is worth reading, and on two subjects it is difficult to imagine they can ever be eclipsed. The first subject is the Innervation of the Larynx, and the second is the Early Diagnosis and Operation of Laryngeal Cancer. Semon's researches on the first subject can never be forgotten, even if his conclusions may require some modification. That the enthusiasm he gave to the subject of cancer of the vocal cords was abundantly necessary, is shown by the neglect the public and the profession still display in the matter of early diagnosis of persistent hoarseness.

Another reason why Semon has done well to publish his collected works is that he has the pen of a ready writer. That he should be able to speak so gracefully and fluently in a language which he learnt after he was qualified has always been a wonder of medical society in London. This accomplishment will be forgotten, but the memory of his literary skill is enshrined in these pages, and outside the comparatively restricted field of laryngology these two volumes will be sure to be referred to in the far-off future for their wonderful pen pictures of Garcia, the discoverer of the laryngoscope; of Morell Mackenzie, the founder of British laryngology; of Virchow, and of others. The Semon Lectureship of the London University, founded by his colleagues and friends, will keep his name alive while London lasts, and in these two volumes he has himself raised a monument more enduring than brass. We wonder how many laryngologists who attended the recent Congress of Medicine will leave a record half as noteworthy? The rising generation of throat surgeons would do well to turn to these volumes and note their extent, their vigour, their variety, their scientific spirit, and their literary finish; and in these days of slackness they might do worse than lay to heart the words at the head of the preface—"Life is calling to you; be a man."

[1] *Forschungen und Erfahrungen, 1880–1910; Eine Sammlung ausgewählter Arbeiten.* Von Professor Dr. Felix Semon, K.C.V.O., Fellow of the Royal College of Physicians, etc. Zwei Bande. Berlin: A. Hirschwald. 1912. (Roy. 8vo, pp. 680, 676; 3 plates. Mk. 32.)

DISEASES OF CHILDREN.

The large volume entitled *Diseases of Children*[2] edited by Drs. Garrod, Batten, and Thursfield, is an example of what has come to be known as a "system"—that is to say, it is the work of a large number of separate authors, each with particular experience of the subject for which he makes himself responsible. Twenty-two authors, all with the exception of Dr. John Thompson and Dr. J. S. Fowler, of Edinburgh, representatives of London schools of medicine, have united themselves in the work. As is stated in the preface, "they have been encouraged to aim at a comprehensive and authoritative account of the present state of our knowledge of the diseases of children, set forth with a completeness which they believe has not yet been attempted in this country." In undertaking such a task the authors and editors assume a very great responsibility, because there can be no doubt that a work in which so large a number of authors have been associated will be accepted generally as representative of the present state of our knowledge of diseases of children in the British Isles, and especially in London.

The general plan of the book does not differ from that of many others which have been published during the last twenty years. After a few introductory chapters there follow articles upon diseases of the newborn, and diseases of nutrition, and diseases of the several systems in order. Short chapters are also devoted to rheumatism, tuberculosis, congenital syphilis, and the "infectious diseases." The only departure from precedent is that room is found for an article in which Dr. Still groups together some of the conditions in which oedema is from time to time met with in practice. It is quite possible that in spite of the enormous advance in knowledge of disease in childhood the old arrangement remains the most serviceable, but it is well to realize its disadvantages. It is difficult to see why a special chapter should be devoted to rheumatic or tuberculous infection and not to that by the pneumococcus. Search in the articles devoted to diseases of the pericardium, peritoneum, joints, kidneys, and so forth will no doubt disclose some account of the various manifestations of pneumococcal infection, but we find no presentment of it as a whole.

More serious in a book designed for the use of general practitioners is the absence of a connected account of the enormous progress which has been made in the speciality of orthopaedics. For example, scoliosis—surely a common occurrence in childhood—finds no place in the index at all, and seems to be mentioned only under rickets. We should have liked, too, to have found an article dealing with the general hygiene of infancy and childhood, and possibly some information as to the various climates and health resorts of the British Isles in their relation to the health of children.

The individual authors have interpreted very variously the nature of the task entrusted to them. In many of the articles very complete and judicious reference is made to the literature bearing upon the subjects discussed, while the authors' own views are rightly emphasized. For example, we can imagine nothing better than the article upon diseases of the circulatory system contributed by Dr. Poynton. He has been completely successful in giving a clear explanation of what is new, and of presenting what is old in the new light shed on it by modern experimental work. Similarly, the articles by Dr. Batten on organic nervous disease and diseases of muscle, by Dr. Garrod on disorders of metabolism and diseases of the ductless glands, and many others in the book will be accepted as authoritative statements of the present state of knowledge whether the work concerned was done in this country or elsewhere.

On the other hand, the classification, etiology, pathology, symptomatology, and treatment of the diseases of nutrition and digestion are condensed into very few pages, and Dr. Hutchison does not seem to have considered it necessary to discuss a great deal of recent work. Dr. Cautley makes a few references, not always very clear, to Continental work. "Spasmophilia has been ascribed to whey," he says. "Possibly this intolerance is of the nature of anaphylaxis." May this not lead to some confusion between the work on

[2] *Diseases of Children.* By various authors. Edited by A. E. Garrod, F. E. Batten, and H. Thursfield. London: E. Arnold. 1913. (Roy. 8vo, pp. 1199; 182 figures, 2 coloured plates. 30s. net.)

spasmophilia of Finkelstein and others and the observations of Hamburger on the anaphylactic phenomena which the protein of the cow's milk may produce? Even the small amount of work upon such subjects which proceeds from this country is not adequately related. The work of Lane-Claypon upon the so-called ferments of milk, although it has been everywhere accepted as authoritative, so far as we have observed, is not mentioned.

As we have ventured to indicate, the book, as often happens in the case of such combined efforts, is unequal, but we have no doubt that it will deservedly meet with a favourable reception, for taken as a whole it is by far the most complete account of diseases of children which has yet appeared in this country.

THE LAMSON CASE.

IT is more than thirty years ago since the profession was shocked by the cruel and sordid murder committed by George Henry Lamson,[3] a medical practitioner, by means of the comparatively rare and little known poison aconitine. The trial must remain a textbook case because it was the first occasion on which this poison was made the subject of a judicial inquiry in a British court, and especially on account of the excellent and convincing evidence adduced by the late Sir Thomas Stevenson, the eminent toxicologist.

The victim of the crime was a youth, aged 19, named Percy Malcolm John, a cripple suffering from complete paralysis of the lower extremities, the consequence of angular curvature of the spine; he was the only surviving brother of Mrs. Lamson, and was entitled on his majority to a sum of about £3,000, of which Mrs. Lamson would be entitled to half should he die before reaching that age. Lamson, who was the son of the American chaplain at Florence, claimed to be a Doctor of Medicine of the University of Paris (to which his right was denied by the Dean of the Faculty, see JOURNAL, 1882, vol. i, p. 23), and appears in the British *Medical Register* for 1879 as L.R.C.P.Edin., L.R.C.S.Edin., June 3rd, 1878, where his address was given at Rotherfield, Sussex. According to the *Medical Directory* he had served as an assistant in the French Ambulance Corps during the war of 1870–71, and under the British Red Cross in the Servian war of 1876–7; there was evidence in the affidavits sent to the Home Office that he was in charge of a hospital at Bucharest in 1877–8; he claimed to possess the Orders of the Star of Roumania and of the Medjidie, but as he had used a false testimonial from Professor Sir George Humphry (see BRITISH MEDICAL JOURNAL, *loc. cit.*), and made a false claim to the M.D.Paris, the L.R.C.P.Lond., and the D.P.H.Cantab., it is impossible to attach complete credence to his statements. At one time he passed as a man of character and respectability, as shown by the affidavits which were sent to the Home Secretary after his sentence; but at some time, variously dated as 1878 or 1879, he fell a victim to the morphine habit, and the only excuse to be found for his criminal conduct is that his moral sense, powers of judgement, and self-control had been destroyed. According to the affidavit of the medical superintendent of the Bloomingdale Asylum for the Insane in New York, the criminal's grandmother, grand-uncle, and aunt were all inmates of the asylum and died there.

The facts of the crime may be briefly stated. Lamson was in serious financial difficulties, having had several executions in his house, and had obtained cash for a worthless cheque. On November 24th he purchased 2 grains of aconitine at Allen and Hanbury's, and on December 3rd he visited the school at which Percy John was a boarder, bringing with him a cake, some sweets, and a box of gelatine capsules. He had an interview with the boy in the presence of Mr. Bedbrook, the schoolmaster, and produced the cake, of which he gave the boy a piece and ate some himself; he showed the box of capsules, and recommended them as an American invention enabling nauseous medicines to be taken with ease; filling one of the capsules with sugar he shook it and gave it to the boy saying, "Here, Percy, you are a swell pill taker; take this and show Mr. Bedbrook how easily it may be swallowed." Immediately after doing this Lamson hurried off to catch a train for the Continent; he had obtained some more money by cashing another worthless cheque, and did, in fact, leave that night for Paris. Ten minutes after he had gone the boy complained of being seriously unwell, and said he felt "just the same as he did after his brother-in-law had given him a pill at Shanklin." He complained of soreness of the throat and of great pain, so that the medical man called to his assistance injected morphine, but he died at 11 o'clock the same night. The *post-mortem* examination was performed by Mr. Thomas Bond, the expert constantly employed by the Home Office, and the vomit, stomach contents, and viscera were carefully reserved for further examination and analysis. This material was handed over to Dr. Stevenson, Lecturer on Forensic Medicine and Toxicology at Guy's Hospital. The facts as reported in the press threw grave suspicion on Lamson, and on December 8th he gave himself up at Scotland Yard, when he was taken into custody and charged with the crime. He was brought before a police magistrate at Wandsworth and remanded, but so soon as the report of the case appeared the assistants of Messrs. Allen and Hanbury remembered selling the aconitine, and were able to afford material assistance to the prosecution by proving that this poison had been supplied by them to Lamson, whom they identified. The trial began at the Central Criminal Court on March 8th, 1882, before Mr. Justice Hawkins, afterwards Lord Brampton, and lasted six days. No witnesses were called for the defence, but after an impartial statement of the case for the prosecution by the then Solicitor-General, Sir F., afterwards Lord Herschell, and a lucid summary of the evidence by the judge, the jury found a verdict of guilty, and sentence of death was pronounced. An attempt was made on behalf of the prisoner to show that he was insane, and a number of affidavits were sent to the Home Secretary, Sir William Harcourt, of which the general tenour has been already explained, but it is somewhat remarkable that the President of the United States cabled to the Home Secretary to grant a postponement of the execution in order that these documents might be duly considered. The prisoner was duly respited from April 2nd to April 28th, when, no sufficient cause having been found for interfering with the execution of the sentence, he was hanged by Marwood at Wandsworth Prison, and his body buried within its precincts.

The case is memorable on account of the full description of the symptoms from which the murdered lad suffered and from the care with which the poison was identified by Dr. Stevenson, but at the time a good deal of attention was drawn to the facilities with which virulent poisons might be obtained by any one assuming the name of a medical practitioner. The judge, in his summing up, expressed the hope that the law would be strengthened, and to this suggestion the jury added a rider to that effect to their verdict. In consequence the Home Secretary addressed a circular to various authorities asking them to express their views on the sufficiency of the existing regulations. In an article in this JOURNAL (vol. i, 1882, p. 467) the law was lucidly explained, but it was stated that the statute was constantly violated in the interests of trade and in disregard of the public safety. It was pointed out that the statute directed that a poison register should be kept, and that Section 17 applied to every one to whom the poison was sold, whether a medical man or not; in this case no record had been kept of the sale of aconitine to Lamson, whose name, when published in the newspapers, recalled the transaction to the memory of the assistants who sold him the poison, yet they at first thought atropine and not aconitine had been sold. The JOURNAL called for more careful attention to the law and for the prosecution of those who neglected its provisions. In the *Pharmaceutical Journal* of the same period there is published a correspondence between the Home Secretary and the Council of the Pharmaceutical Society, but the editorial remarks, on the whole, defended the existing system and omitted all reference to the fact that no entry had been made in the register of the sale of the poison. Later a bill for the amendment of the Sale of Poisons Act was announced by Mr. Mundella as about to be introduced into the House of Lords, but nothing came of it. We are not sure that further legislation is needed, but we

[3] Notable English Trial Series. *Trial of George Henry Lamson.* Edited by Hargrave L. Adam. Edinburgh and London: William Hodge and Co. 1913. (Med. 8vo, pp. 192; 5 illustrations. 5s. net.)

may express the hope that greater care is shown to comply with the law than appears to have been the case thirty years ago.

CLINICAL LABORATORY HANDBOOKS.

The type of book to which *Laboratory Methods*,[4] by the Drs. Williams, belongs has become increasingly familiar of recent years. Its object is laudable, for it aims at making each practitioner familiar with ultra-clinical tests so that he may carry them out himself, instead of referring to the opinions expressed by others. No object could be deserving of more praise, but when the method the authors have chosen to carry out their purpose comes to be considered, we fear it must be said that they have not chosen the best, for no practitioner who has been unfortunate enough to have been trained on a faulty curriculum would really be made any more efficient by endeavouring to bring himself "up to date" by studying this work. It would be far better if the authors, in common with others who have essayed the same task of "improving" the general practitioner, had spent time and money in seeking to send practitioners who, by reason of the rapid advance made in laboratory methods, felt they were falling behind in the race, back to their medical schools to take out courses under fully trained expert teachers. We have only to turn to Chapter VII, on the detection of common poisons, to find grounds for this criticism, for the subject is dismissed in nine pages. We quote from it: "Sulphonal, trional, etc. Either drug heated in a test tube with powdered wood charcoal develops a characteristic odour—ethyl mercaptan. If this odour is not familiar to the physician, he should run a control test, using sulphonal instead of 'X'." This quotation will show how impossible it is to give technical knowledge of a large number of complex and difficult problems in a volume of small calibre. Much information contained in its pages on the sputum, urine, stomach contents, etc., is what is accepted by the profession, but any practitioner who is so earnest in his work as to wish to keep abreast with advances in medicine could surely be relied upon to develop unassisted the homely devices recommended by the authors, would be disposed to read larger and more authoritative works than this one, and would be able to distinguish problems, the solution of which might be reasonably undertaken by a general practitioner, from those which assuredly should be left alone by him and handed over to some one who by a life's devotion to the subject had made himself an authority. It would be far better for a practitioner to submit many of the difficult problems such as are given in this book to some expert, even though he resided in some distant centre, than to endeavour to settle the difficulty on the spot himself.

The volume *Clinical Laboratory Methods*,[5] by Dr. R. S. Morris of St. Louis, in no way belies its title. It is a handbook for use in a clinical laboratory, and concerns itself mainly with six subjects—the examination of the urine, of the gastric juice, of the faeces, sputum, blood, and puncture fluids. There is no attempt made to introduce clinical matter, either to the glorification of laboratory diagnosis or to the belittling of mere clinical investigation. The author has made free use of the works of writers whose names are known all over the world as first-rate authorities on their special subjects of laboratory investigation. Dr. Morris has done good service, because he has extracted from more ambitious volumes just those methods which have proved of most service, neglecting those which, though of interest to physiological chemists, are hardly of practical value in the investigation of disease. His design was to produce a book useful to medical students and practitioners, but the compass of the volume is such as really to make it more valuable as a reference book for those whose time is more or less given to laboratory investigation. Few men outside the pale of long experience of laboratory methods would care to trust themselves to carry out the investigations planned by Rowntree or Geraghty to estimate the functional activity of the kidneys, or Kjeldahl's method of determining the total nitrogen excretion. The reader, however, may neglect these ambitious excursions and find the volume full of simple methods of investigation. He will also be grateful for the admirable section on the intestinal parasites.

[4] *Laboratory Methods, with Special Reference to the Needs of the Practitioner.* By B. G. R. Williams, M.D., assisted by E. G. C. Williams, M.D. With an Introduction by Victor C. Vaughan, M.D., LL.D., Professor of Hygiene and Physiological Chemistry, University of Michigan. London: Henry Kimpton. 1912. (Med. 8vo, pp. 204; 43 illustrations. 10s. net.)

[5] *Clinical Laboratory Methods: A Manual of Technique and Morphology designed for the Use of Students and Practitioners of Medicine.* By Roger Sylvester Morris, A.B., M.D., Associate Professor of Medicine in Washington University, St. Louis, etc. New York and London: D. Appleton and Co. 1913. (Med. 8vo, pp. 363; 46 figures. 12s. 6d. net.)

NOTES ON BOOKS.

The *Amateur Gardener's Diary and Dictionary*[6] consists as to the first part of a diary giving five or six pages to the month; on the right-hand page are spaces for notes on each day, on the left suggestions as to sowing and planting and cultivation. It will be useful to all amateur gardeners, but particularly perhaps to the week-ender who is often perplexed to know which of many things that should be done in the very limited time at his disposal it is best to do first. The second part consists of a series of notes, arranged in alphabetical order, on many of the plants most commonly grown, and on certain gardening operations and materials. The information is very condensed, but will carry the amateur a long way.

In the preface to his little *Manual of Medicine*[7] Dr. A. S. Woodwark says that he has written it in the hope of supplying a vade-mecum for the student clerking in the wards or out-patient department and a convenient reference for the busy practitioner. It is an attempt to compress the substance of a good many books, for it includes not only the ordinary pathology, symptoms, diagnosis, and treatment of the textbook of medicine, but the details of clinical investigation such as are usually practised in the wards of hospitals. As might be expected where so much is attempted, there are many omissions, and each part may in this way be open to criticism, but, taking it as a whole, we may congratulate Dr. Woodwark on having successfully attained his object.

MEDICAL AND SURGICAL APPLIANCES.

Apparatus for Intravenous Injection of Salvarsan.

Mr. Leonard Myer, F.R.C.S. (London, W.), writes: In using the ordinary outfit for the intravenous injection of salvarsan one is dependent on an assistant, who may not be a very efficient one. Messrs. W. H. Bailey and Son have made for me a special apparatus which does away with the necessity for all assistance. Its chief feature is the adaptation of a portable photographic tripod with a special holder and glass container. There are also one or two other smaller improvements—a needle which is specially bent to prevent the pulling of the point of the needle against the wall of the vein, and also to facilitate its introduction. The outfit is quite cheap. The apparatus is useful for intravenous injection generally, including that of normal saline in collapse and ether for anaesthesia; also for subcutaneous infusion of saline, rectal infusion, or irrigation of the colon after appendicostomy.

[6] *Amateur Gardener's Diary and Dictionary, 1914.* London: The Cable Printing and Publishing Company, Ltd. (Fcap. 8vo, pp. 227. 1s. net.)

[7] *Manual of Medicine.* By A. S. Woodwark, M.D., M.R.C.P. Oxford Medical Publications. Edinburgh, Glasgow, and London: Henry Frowde and Hodder and Stoughton. 1912. (Cr. 8vo, pp. 420; 3 plates. 10s. 6d. net.)

THE MOTOR SHOW FROM THE MEDICAL MAN'S POINT OF VIEW.

POINTS ABOUT CARS AND PRICES.

By H. Massac Buist.

Having dealt in general terms last week with the outstanding features and general tendencies of the Motor Show as it is calculated to appeal to the requirements of the medical profession, some of the main features of certain cars displayed may be summarized under a scheme whereby they are classified in groups according to the prices of the complete vehicles, the limit being set at £500. For the purposes of contrast in the limited space at disposal, examples alike of distinctive and conventional constructional practice are given. Wherever possible the equipment included in the price is specified. In some cases this is what is barely necessary to drive the car on the road, while in others it is of an absolutely complete character. As there are hundreds of makes of cars on the market, it is, of course, impossible to deal individually with every example, and the mention of a car in the following paragraphs does not necessarily mean that in the writer's opinion it is well suited to the needs of medical men who have to submit their automobile to very hard usage. In the light or cyclecar section we are to look for the introduction of still other models at the Motor-Cycle and Cyclecar Show, which will succeed the current exhibition that closes at Kensington on Saturday night. The Motor-Cycle, Cyclecar, and Cycle Show will be opened to the public there on November 24th instant.

The £475 Electrically Lit Wolseley Type.

There has been no occasion to remodel in any essentials the 16–20-h.p. four-cylinder Wolseley car which has achieved the distinction of finding the widest popularity of any motor vehicle yet produced in a British factory, in that something in the neighbourhood of four thousand of these machines have been produced in the last manufacturing year, and an increased rate of output will be maintained this year, by reason of continued concentration on a three-model programme, the two larger vehicles being six-cylinder machines. The outstanding features of the four-cylinder Wolseley are the degree of refinement achieved in combination with the quality to withstand hard wear and tear, these vehicles having long since earned a high reputation in the hands of the medical profession in this country. The bore measurement is 90 mm. and the piston travel 121 mm., giving a volume of 3,180 c.cm. The gearbox is, of course, of the three-speed sort, and the clutch is of the many disc type. Rudge-Whitworth detachable wire wheels are standard, together with hood, screen, complete electric lighting power, generating plant and set of lamps, and so forth, the body being of uncommon ample proportions. The price of the complete vehicle is £475. The rear springs are hung from the back axle. The compressed air starter, which the firm introduced last year on the six-cylinder models, is now available as an extra on the four-cylinder sort, and has a Dermatine compressor valve. Moreover, a pedal is substituted for one of the hand controls for the distributor.

A £475 Sizaire-Berwick 20-h.p. Chassis.

A new make of car introduced to Britain at this show by the firm of F. W. Berwick is the four-cylinder nominal 20-h.p. Sizaire-Berwick machine of 90 mm. bore measurement by 160 mm. piston travel, with four-jet carburettor, clutch of the many disc type, four-speed gearbox, bevel driven back axle and Rudge-Whitworth detachable wire wheels, sold in chassis form at £475. Some distinctive features of the construction of this vehicle are that the valves have proportionately large mushroom heads and thin stems that are each guided quite up to the head, so that they are shielded from the exhaust gases. The light steel pistons are machined out of the solid. Hollow connecting rods are employed, as well as gudgeon pins of large diameter. The flywheel is original in that it is a composite one, fashioned of three light members balanced individually, then bolted together. The back end of the car frame is of bridge formation to clear the axle, from which the long flat half elliptic springs are hung, neither torque nor radius rods being employed.

The £475 Self-starting Six-cylinder Hudson.

From America comes the Hudson 25-h.p. six-cylinder car built on European lines with the cylinders cast in threes, the bore measurement being 87 mm. and the piston travel 127 mm. This machine has the mixture fired in the cylinders—as well as the car lighted and the engine started—by the Delco electrical apparatus. The gearbox is of the three-speed sort, the bevel drive is employed in the back axle, and the clutch is of the many disc type. The machine is supplied as a seven-seated car with one-man hood, luggage-grid, tyre-carrier, clock, speedometer, electric signal horn, and all lamps, for £475. The constructional features may be described as following well approved European practice.

The £450 Four-seater 15-h.p. Napier.

The Napier firm this year supplies its three-speed 15-h.p. four-cylinder bevel-driven model, with wooden wheels, five-seated body, hood, and screen, for £450 complete. The four-speed worm-driven model with Rudge-Whitworth detachable wire wheels costs £45 more, while there is introduced this year a 16–22-h.p. four-cylinder type, with 7 mm. larger bore measurement, the same piston travel, a plate instead of a many disc type of clutch, to retail as a complete vehicle for £550, the chassis price being £450. The cheapest of these three models is, of course, the lowest priced Napier that has ever been offered to the public.

The £450 Five-seater 19.9-h.p. Valveless.

The two-stroke system of engine construction is illustrated by the Dodson exhibit of a two-cylinder 19.9-h.p. valveless car having a bore measurement of 127 mm. and a piston travel of 140 mm., giving a volume of 3,546 mm. It is fitted with a four-speed gearbox, worm-driven back axle, the firm's own carburettor, and is supplied with hood, screen, horn, number plates, three lamps, and spare Shrewsbury-Challiner rim for £450. There is a 15-h.p. model supplied with the same equipment for £20 less. These engines are built by David Brown and Sons, of Huddersfield, and have six working parts apiece—two piston rods, two connecting rods, and two crank shafts. These cars are now furnished with longer wheelbase, also improved silencing, while the stroke measurement of the larger type has been increased by half an inch. The firm also markets Belgian built Sava cars of 14–18 and higher horse-power, the chassis price of the one named being £293.

The £424 Six-cylinder Delage Complete Car.

Delage set a notable lead to the European motor industry a couple of seasons ago in introducing a 15.9-h.p. six-cylinder car designed to bring this principle within the range of the motorist of moderate means. As the result of some seasons' experience with this system the type is shown with some improvements, as instance the furnishing of a larger oil reservoir, the provision of an extra bearing to the crankshaft to stiffen it and eliminate periodic vibrations, the employment of chain drive for camshaft and magneto machine, and the enlargement of the water space round the exhaust trunk. Compression taps are fitted, but there are no radius rods now, the drive and torque being taken through the forward end of the long back springs. Larger exhaust pipes and silencer are furnished. This machine is further notable in that all six cylinders are cast in one piece, the bore measurement being 65 mm. and the piston travel 130 mm. The vehicle is sold with two-seater body for £424, or for four-seater body for £447.

The £410 12-h.p. Talbot Model.

The Clement-Talbot Company markets three models that come within the price range under consideration. All are four-cylinder cars with the casting done in pairs, and are equipped with four-seater bodies. The 12-h.p. type is sold with hood, screen, horn, and electric lighting set for £410, in which condition the new 15–20-h.p. model of 10 mm. longer piston travel is marketed for £460. The 20–30-h.p. four-cylinder model is sold with five-seater body, but without hood, screen, horn, or electric lighting set, for £495. The design of the pistons has been improved to reduce to a minimum the likelihood of any ingress of oil and consequent formation of carbon deposit. A gear pump, immersed in oil and driven from the cam-

shaft, forces lubricant under a pressure of 15 lb. to the square inch to all the engine bearings save the gudgeon pins, which are lubricated by splash. A valve locked in position prevents the manufacturer's adjustment of the oil pressure being unintentionally disturbed. The springs are in all cases calculated for the precise form of body fitted.

The £390 Four-cylinder Austin Car.

The 10-h.p. Austin car, embodying most of the firm's distinctive constructional features, having a bore measurement of 76 mm. and a piston travel of 89 mm., magneto ignition, Claudel carburettor, cone clutch, four-speed gearbox, bevel-driven back axle, detachable wood wheels, 9 ft. wheelbase, smart four Phaeton body of streamline form, one-man hood, double folding wind-screen, spare wheel, Lucas head-lamps and generator, three paraffin lamps, speedometer and all necessary tools, is sold complete for £390. Artillery wooden wheels are employed in combination with a stout section rim particularly suitable for the colonies. If the flanges are not made of ample proportions for overseas service, they are apt to be dented by impact with stones, thereby preventing the beads of the tyre coming away from the flanges when it is required to change pneumatics.

The £390 Five-seater Sunbeam.

The 12–16-h.p. four-guinea tax four-cylinder Sunbeam, of 80 mm. bore measurement by 150 mm. piston travel, with four-speed gearbox and bevel driven back axle is sold with five-seater body for £390. This pattern now enters on its third year, and is a type of car that has made much latter-day motoring history. It is furnished with sundry improvements, including the setting of the gearbox back 3 in. further from the flywheel to furnish a longer shaft and enable the two universal joints to be supplemented by a pair of metal discs sandwiching a rubber one, which is very effective in isolating vibration in that region of the car. The cooling surface has been slightly increased, the diameter of the steering wheel is 1½ in. more, and the steering column is provided with a substantial support from one of the cross-frame members. There has been no occasion to redesign the suspension, but it has been much improved by the use of chrome nickel steel springs. The coachwork has also been greatly improved, the front seats being mounted to slide on rails and lock in any position, so that they are adjustable fore and aft to suit users of any physique. Ingenious patented means are also employed for preventing body rattling or creaking. The details of the work of constructing the doors should be examined. This machine, of course, gives fully 37-h.p., and is fitted with the latest pattern Claudel carburettor, which gives improved acceleration in combination with greater economy. The larger size of nominal 16–20-h.p. engine rating, having a 90 mm. bore and 160 mm. piston travel, is sold with five-seater body for £535, that price including a Rotax-Leitner dynamo electric lighting set.

The £385 15-h.p. Standard Car.

Apart from the 9½-h.p. four-cylinder light car mentioned last week, the Standard firm produces a 15.6-h.p. model of 79 by 121 mm. engine measurement, which is now fitted with a four-speed gearbox, and sold with four-seater body, five lamps, hood, screen, horn, and fifth detachable steel wheel and tyre for £385. The stoutly designed gear-shafts are borne on ball bearings, while the control on the gate-quadrant principle is so arranged that the hand-brake lever is on the inner side of the gate to facilitate the fitting of streamline bodies as well as to simplify the scheme of working the gear rods and levers. There has been no occasion to make any change in the 20-h.p. type, which, with five-seater body and the same equipment, costs £100 more. These vehicles are very conscientiously designed and manufactured at Coventry under the personal supervision of Mr. Cyril Maudslay.

The £375 15–20-h.p. Armstrong-Whitworth Chassis.

The world-famous engineering firm of Armstrong-Whitworth markets its smallest chassis of 15–20 nominal horse-power for £375, the motor having a bore measurement of 80 mm. and a piston travel of 135 mm., so that the volume is 2,710 c.cm. The clutch is of the many-disc sort, the gearbox giving four forward speeds. A worm-driven back axle, detachable wire wheels, Zenith carburettor and dual ignition are employed. There is also a Colonial model at the same price with 2½ in. more ground clearance. The purchaser selects his own coachwork details for fitting to the chassis. A quite new model introduced this season is also a four-cylinder vehicle of 20–30-h.p. rating, the bore measurement being 90 mm. and the piston travel 150 mm., and the chassis price £500. The carburettor is bolted directly to the block engine casting, thereby obviating the likelihood of air leak. Very light cast-iron pistons are used, the connecting rods being of high tensile nickel steel. The five bearing crankshaft is of proportionately large diameter. The clutch needs no oiling. Any liability of the change speed lever to jamb in action under frame distortion is obviated by carrying it on an arm from the gearbox.

The £375 N.B. Four-seater.

Apart from the 20–40-h.p. Nazarro cars that cost £495 for the chassis, Newton and Bennett are the British concessionaires for the 15–24-h.p. S.C.A.T. car, which sells with five-seater body, detachable steel wheels, four-speed gearbox, disc clutch, rainproof hood, wind-screen, lamps, horn, and a combination pneumatic N.B. engine starter and tyre inflator, for £465, the bore measurement being 85 mm. and the piston travel 130 mm. There is also the 12–h.p. Italian-built N.B. four-cylinder car of 70 mm. bore by 140 m.m. piston travel, sold. with four-seater body, hood, screen, lamps, horn, and the firm's mechanical engine starter, for £375. This has also detachable steel wheels, bevel-driven back axle, and four-speed gearbox. The clutch is of the plate type; motor, clutchpit, and gearbox being combined on the three-point suspended unit principle. The clutch needs no lubrication. The clearance of the car is comparatively high, being 9½ in. The engine starter is produced under the Harper patents, and has been proved serviceable for some seasons past. It is simple, consisting of a small modification in the gearbox that enables the driver, by a single pull at the gear lever, to start the engine from his seat. There are no free wheels or working parts in operation while the car is running. The device consists of three parts.

The £350 Electrically-lit Rover Four-seater.

The Rover car is made in one type only—a 12-h.p. four-cylinder vehicle of 75 mm. bore measurement by 130 mm. piston travel, marketed complete with four-seater body, rainproof hood, wind screen, fifth wheel and tyre, signal horn, and Rotax-Leitner dynamo and electric lighting set, for £350. If only a two-seater body is required the price is £331. This is one of the few middle-sized cars I know so designed that a three-speed gearbox, with all the consequent gain of quietude, strength, and simplicity, is sufficient for all conditions of service. The design and the manufacture have alike been proved right over a period of two years. The back axle is worm-driven. Neat ventilators are now furnished to the front seats for use in hot weather, while the purchaser has the option of six inches longer wheel-base. Longer wearing qualities and smoother action have led to the use of an endless belt for driving the fan behind the cooler. The petrol tank is no longer part of the dash-board but is fitted independently of it, so that it can be removed when necessary. It may further be noted that a Colonial model using Sankey steel detachable wheels, a straight front axle, stouter springs, gear ratios to suit the larger wheels and tyres, a 4 ft. 8½ in. track, and overhead in place of underhung worm, is marketed as a four-seater for £25 more than the model for European service.

The £333 11–16-h.p. Adler Car.

Apart from the 200-guinea light car referred to last week, the Adler programme includes an 11–16-h.p. water-cooled four-cylinder car of 67 mm. bore by 110 mm. piston travel, giving a volume of a fraction of 1½ litres, which sells, complete with four-seater touring body, tyres, tools, but without lamps, hood, or screen, for £333. The 14–18-h.p. size also comes within the range of car under consideration, the price, including the same details of equipment, being £395. In this case the bore measurement is 75 mm. and the piston travel 118 mm., giving an engine volume of 2,080 c.cm. Four-speed gearboxes and bevel driven back axles are employed in both cases. The mechanical details of the models remain as before.

Sundry De Dion-Bouton Types.

The De Dion Company, which for many years has numbered many medical men in its *clientèle*, acquired its reputation among them primarily through its provision of one and two cylinder cars, which, though of quite low prices, proved thoroughly satisfactory vehicles for professional purposes. Comparatively recently it has extended its programme, and, as was pointed out last week, it now includes four-cylinder chassis at prices not far off those formerly charged for the lower powered cars, and a 24-h.p. chassis with an eight-cylinder engine, vended at a sum probably not above that which a good many medical men are prepared to spend. The De Dion-Bouton chassis of the four-cylinder sort that come within the price stipulated by the average medical man are the 8–10-h.p. three-guinea tax model sold at £221; the 12-h.p. 3-guinea tax type at £275, the 14-h.p. 4-guinea tax size at £310, and the 18-h.p., having a bore measurement of 80 mm. and a piston travel of 140 mm., at £372. If a body of a plain sort is needed, coach-work and fittings should be procurable for another £100. The smallest model named is quite a new pattern, having a bore measurement of 56 mm. and a piston travel of 120 mm. The four-cylinder motor has a two-bearing crankshaft of proportionately large and heavy design. Cast steel pistons are used. Engine, flywheel pit, and gearbox are bolted up to form a unit.

The £300 Four-seater 10-h.p. Bayard.

The 10-h.p. four-cylinder French-built Bayard car, with 65 mm. bore measurement and 120 mm. piston travel, is introduced with four-seater body, three-speed gearbox, bevel driven back axle, Sankey detachable steel wheels, Solex carburettor, rainproof hood, wind-screen, fifth wheel and tyre, and five lamps, for £300. The 14-h.p. model that comes under the four guinea tax, having a bore measurement of 80 mm. and a piston travel of 130 mm., as well as a four-speed gearbox, sells with similar equipment of proportionately larger size for £385. The gear control is on the gate change principle in this particular model. In these vehicles the propeller shafts are enclosed in steel torque tubes. A still lower priced model is a four-cylinder 8-h.p. chassis, which is sold with two-seater body and without a spare wheel or tyre, but with all other necessary equipment, for £232, fixed wire wheels being employed.

The £295 12-h.p. Gladiator.

The French-built four-cylinder 12.1-h.p. Gladiator car of 70 mm. bore by 110 mm. piston travel is sold as a two-seater complete with hood, screen, dicky, five lamps, horn, and spare wheel, or rim, for £295. The constructional practice embraces the firm's cylindrical three-speed gearbox and its own carburettor; otherwise, the car more or less follows out the conventional motor engineering practice of the day.

The £285 Self-starting Hupmobile.

The feature of the 15–18-h.p. four-cylinder Hupmobile car for 1914 is that it is fitted as standard with the Westinghouse electric engine starter and car lighting outfit, four-seated body, English made rainproof hood, double-jointed wind-screen, electric horn, tool equipment, detachable rims and a spare, together with Michelin tyres, for £285. The chassis in the main follows conventional constructional practice.

The £265 Foy-Steele Car.

The firm of Jarrott introduces a two-seater model, 14.3-h.p. four-cylinder Foy-Steele car of 76 by 127 mm. engine measurements, with three-speed and reverse gearbox, bevel driven back axle, five lamps, horn, hood, and screen, complete for £265, the price of the four-seater being £315. These machines were introduced to the market last year.

The £230 11.9-h.p. Phoenix.

The 11.9-h.p. four-cylinder Phoenix car comes under the three-guinea tax, having a bore measurement of 69 mm. and a piston travel of 100 mm. It is sold complete with hood, screen, five lamps, signal horn, tools, detachable spare wheel, tyre, and two-seater body with doors, for £230, the policy of the firm being out of the ordinary in that such a detail as the number plates are included in the fixed price. This machine has a worm-driven back axle, magneto ignition, Stewart carburettor, three-speed gearbox, and 8-ft. wheelbase, while the width of the body is sufficient to render it possible for the car to accommodate three persons seated abreast. The shoe-shaped bonnet, accessible from three sides, and radiator in front of the dashboard is employed. For £55 more this vehicle is supplied with 18 in. longer wheelbase and a body to seat four or five persons, together with one-man hood and collapsible luggage carrier.

The £225 10–12-h.p. Belsize Two-seater.

The four-cylinder water-cooled 10–12-h.p. Belsize car of 69 mm. bore measurement by 130 mm. piston travel is sold complete for £225, the purchaser now having the option of worm or belt-driven back axle. A feature of this car is the unit system of combining the motor, clutch, and circular gearbox carried in a trunk which supports the clutch, and which is bolted at its forward end to the back of the crank-case. A practical point is that it is easy to withdraw the gearbox with its foot-brake from the rear end of the trunk, a coupling between the gear shaft and the clutch shaft being furnished to this end. The valve tappets are now adjustable, and springs have been introduced to keep them up to the heels of the stems, thereby making for silence of action. The engine is oiled under pressure, and a single tapered form of spring is furnished to the back of each of the rear main springs to act as a shock absorber. The price includes two-seater body, lamps, horn, tool kit, hood, and wind-screen. The 15.9-h.p. model is sole as a four-seater for £360, the equipment including electric dynamo for lighting the car, together with accumulators, lamps, and switches.

The £225 15–18-h.p. Buick Car.

From America comes a price proposition in the 15-18-h.p. four-cylinder water-cooled Bedford chassis of bore and stroke measurements each of 95 mm., with magneto ignition, Zenith carburettor, leather cone clutch, Baker rims, three-speed gearbox, bevel-driven live axle, sold complete with London-built Bedford two-seater body, five lamps, horn, speedometer, spare rim, hood, screen and number plate, for £225.

The £220 10-h.p. Turner Two-seater.

The 10-h.p. four-cylinder, block engine, water-cooled Turner car of 60 mm. bore measurement by 100 mm. piston travel with three-speed gearbox and worm drive, has a channel steel frame and two cross bearers carrying the subframe that supports the motor and gearbox. The back axle is now of the enclosed tubular type, while the ignition is fixed, therefore there are no levers on the steering column or wheel. The standard equipment provides waterproof hood, two acetylene head-lights, the side and tail lights being of the oil sort. The radiator is of pointed design and the rear springs are of the inverted quarter-elliptic type, wire wheels being fitted. The firm also introduces a new 12-h.p. model of 69½ mm. bore measurement by 120 mm. piston travel, sold as a two-seater for £275.

The 200 Guineas Four-seater Briton Car.

The four-cylinder Briton cars are built at Wolverhampton, the 10-h.p. variety having been introduced a year ago, since when the firm have found it necessary to concentrate the major portion of its work on the output of this type, which is supplied with four-seater streamline body, an engine of 68 by 120 mm. dimensions, gate controlled three-speed gearbox, three lamps, signal horn, hood and screen, for 200 guineas. A two-seater type is marketed with the same fitments for 175 guineas.

The £200 9-h.p. Hillman Light Car.

The British-built 9-h.p. four-cylinder Hillman light car of 60 mm. bore measurement, with a piston travel twice as long, is sold complete, with two-seater body, hood, screen, five lamps, horn, spare wheel and tyre, for £200. The firm's other enterprise is the production of a 13–25-h.p. six-cylinder model of the same engine dimensions, having a bevel instead of a worm-driven back axle, but retaining the other mechanical features, including detachable steel wheels, three-speed gearbox, leather cone clutch, Solex

carburettor, magneto ignition, and sold with four-seater body complete for £480, including a spare wheel and tyre. This is the smallest British-built six-cylinder car.

The 190 Guineas Morris-Oxford Light Car.

The Morris-Oxford two-seater light car, which has been familiar on the roads during the last twelve months, has been considerably improved in detail for 1914, and is marketed complete with hood, screen, five lamps, horn, and a spare wheel without a tyre, for 190 guineas, the bore measurement being 60 mm. and the piston travel 90 mm. A White and Poppé carburettor is employed, together with magneto ignition, clutch of the many disc type, three-speed gearbox, worm drive, and Sankey detachable wheels. The wheelbase has been lengthened to 7 ft. 6 in., so that there is room for the fitting of a dicky seat if required, while the track has been widened to 3 ft. 8 in. The stronger back springs are now underslung, and the back axle has been modified in details of design. A complete worm wheel is now used in connexion with the steering details, and the braking has been improved.

The £190 8–10-h.p. Marlborough Car.

The French-built 8-10-h.p. four-cylinder Marlborough car of 59 mm. bore by 100 mm. piston travel, having magneto ignition, Claudel carburettor, multiple disc clutch, Sankey detachable wheels, three-speed gearbox, bevel-driven back axle, spare wheel and tyre, two-seater body, hood and screen, is sold complete for £190. The stranded cables formerly used for the side-by-side brakes on the back wheels are replaced by rods provided with convenient adjustments.

The £168 Calthorpe Minor Two-seater.

The four-cylinder water-cooled block engine, 10–12-h.p. Calthorpe Minor car of 62 mm. bore by 92 mm. piston travel with magneto ignition, Zenith carburettor, Hele-Shaw plate clutch, three-speed gearbox, steel detachable wheels, bevel driven back axle, body, lamps, hood and screen is marketed at £168. A 12–15-h.p. model, with four-seater body, a bore measurement of 69 mm., a piston travel of 125 mm., and detachable wire wheels, retails at £299. The cooling is by the natural circulation of the water, a pressed steel frame being employed in both cases. The smaller model retails with coupé two-seater body for 190 guineas.

The £150 Pilot Light Car.

The 10-h.p. four-cylinder Pilot light car, employing the friction form of power transmission and thereby differing radically from conventional constructional methods, is marketed with wire wheels, final chain drive, fixed Bosch magneto ignition, Zenith carburettor, and two-seater body for £150. The carburettor can be adjusted to run on benzole for those who do not object to that form of motor fuel. This vehicle is staged on Stand 21 by Friction Cars Ltd. Its engine is the four-cylinder water-cooled Chapuis-Dornier engine which has a bore measurement of 60 mm. and a piston travel of 110 mm., so that it comes under the three-guinea car tax and has a volume of 1,245 c.cm., otherwise approximately a litre and a quarter. The lightness of the vehicle enables it to have a ready acceleration, which is further assisted by the mode of power transmission through friction drive, so contrived that there are what would be called five forward speeds.

Coachwork and Accessories at the Motor Show.

As on the occasion of former Shows, so in connexion with this one the Coachwork and Accessories sections contain a number of important displays each by specialists. It is impossible, however, to review these in detail. Suffice it that coachwork is in the main developing along rational lines. It can scarcely be said that any fresh degree of engineering talent appears to have been introduced to the problem of motor body construction this year. Progress is instead revealed chiefly in the direction of employing better proportions and making more ingenious use of the space available, as instance the 16–h.p. Leon Bollée car with a new streamline Connaught torpedo two-seater phaeton, having two extra seats. The movement towards the furnishing of wider doors, particularly in closed carriage work, is illustrated in the six-cylinder Siddeley-Deasey limousine-landaulette of the Connaught-Davenport type, having domed roof and frameless glass windows. The firm introduces a 16-h.p. four-cylinder Leon Bollée car of accessible design. Morgan specializes in medium sized bodies for doctor's work, including ingeniously contrived coupés; while a new design of four-seater coupé-cabriolet on a 15–20-h.p. Vinot chassis is shown by Alford and Alder. There is only one wide door on either side of this vehicle, the near side front seat being constructed to fold up and revolve. The scheme of the windows allows plenty of light to flood into the vehicle on both sides. Standard coachwork has been very appreciably improved by the majority of the British manufacturers.

Among the novelties in the tyre and wheel section is the new twin Dunlop detachable wire wheel that will fit existing single detachable wire wheel inner hubs, and the spokes of which are ingeniously set so that each rim is a driven member without the aid of intermediate bands that set up unnecessary stresses and which provide harbours for stones and so forth. This firm, in common with sundry other leaders in the tyre industry, announces appreciable reductions in the cost of its pneumatics without change in the quality or quantity of the material; or of the workmanship. The Avon Indiarubber Company of Melksham, Wiltshire, introduces a "Sunstone Special" type of pneumatic with extra thick tread, providing the maximum rubber at the point of contact with the road. The surface of this tread is flat, with narrow, clean-cut, transverse grooves. There is also a square type of tread with fluted ridges on its wearing surface. A number of tyre makers, including the Continental firm and the Spencer-Moulton concern, exploit the policy of marketing what are called oversize tyres, otherwise pneumatics of proportionately large section made to fit existing rims that hitherto have only accommodated tyres of smaller section. This method is claimed to provide more luxurious riding, and in spite of the slight initial increase of cost, to achieve economy of wear.

Small Harvey-Frost tyre vulcanizers for the use of private motorists on the pioneer system of this sort are introduced variously under the title of the "Car" and of the "Baby" vulcanizer. The system of operation remains the same, but the scope of their employment has been materially increased by a new attachment introduced to enable internal repairs to covers to be readily and quickly carried out. The device consists of a hollow aluminium mandrel, into which steam is conducted through a pipe screwed to an adaptor at the top of the vulcanizer, the pipe also serving as a supporting column. The instructions issued by the firm are simple, and the developments now incorporated in the instrument will doubtless lead to its being more widely employed in private service. Another ingenious invention is the Triplex safety glass for windows and screens that is built up of three-ply of glass sandwiching two films of celluloid. It does not break like ordinary glass, but merely "stars" when hit by stones.

LONDON MEDICO-PSYCHOLOGICAL CLINIC.

A meeting to inaugurate the London Medico-Psychological Clinic for the treatment of nervous diseases, an account of the objects of which was given in the British Medical Journal of July 19th, was held on November 5th in the Botanical Theatre of University College. Lord Sandwich, who was in the chair, expressed his belief in the immense power exercised by the mind over the human body. He said that, although he knew nothing of medical or surgical science, he had had great experience of healing. During the South African war he had received some sixty wounded officers into his country house, and during the whole time he was at home there had never been a doctor or a nurse in the place. He himself had acted in both capacities towards his guests, and he had been both surprised and gratified by the successes he had obtained. He went on to say that there were few serious maladies that he had not treated with success, and he believed he could say with truth that he had never failed to relieve people in agonies of pain. He had attended people in palaces, in cottages, in hospitals, and in homes; and his patients had included a Hindu monk in his monastery, a Mohammedan in his mosque, and a Hindu princess who had travelled

500 miles to see him. He had often been asked to explain his power, but he had nothing to explain; he could only say what happened. He was convinced, however, that many other people besides himself possessed it, if not to the same extent at least in a lesser degree, and in the proposed clinic there would be an opportunity for them to exercise it with great usefulness.

Dr. CONSTANCE LONG said that many doctors had successfully practised psychotherapy, but up to the present there had been no provision of this kind of treatment for the poor. The object of the medico-psychological clinic, therefore, was to provide and equip with suitable apparatus a small place where treatment by psychotherapy might be obtained by the poorer classes, and where inquirers would be provided with opportunities for study and investigation. The patients would include people suffering from depression, insomnia, loss of sensation, the drug habit, morbid attention to bodily ailments, and many other manifestations of ill health for which no adequate provision existed at the present moment; whilst the treatment would consist of persuasion, suggestion, re-education, psycho-analysis, induced sleep, and even hypnotism. It was particularly important for the public to understand that the clinic would not be in opposition to orthodox medicine, but supplementary and complementary to it, and that it was hoped to join forces with medical practitioners in a suitable building. For this purpose it was proposed to rent a small house in a quiet neighbourhood within easy reach of University College. The expenses of such an undertaking would probably amount to £1,200 or £1,500, of which £650 had already been subscribed. The clinic, at the beginning, would be for out-patients alone, but it was confidently hoped that before long it would be possible to consider the provision of a certain number of beds for the accommodation of the more serious cases.

Dr. SPEARMAN, Professor of Psychology at University College, said that there could be no doubt that science would gain from the foundation of the new clinic. There was a growing interest in, and demand for, psychotherapy which could not be disregarded. Some years ago the foundation of a department for the study of psychotherapy had been greeted with derision, but to-day the laughter had died down, and the knowledge that had been gained remained.

Dr. MAURICE CRAIG said that the new clinic would supply a long-felt want in England. With the exception of one in Liverpool, there was at present no hospital in England where a patient suffering from incipient mental disorders could be taken in and treated in the proper way. The usual fate of such patients, therefore, was that they were left to struggle on as best they might until they were ready to be admitted into lunatic asylums, though a little timely rest and proper treatment such as they would now receive at the Medico-Psychological Clinic would probably have restored them to their full mental and physical vigour. These unfortunates were by no means invariably the derelicts of society, but were frequently very highly endowed and gifted persons, and for this reason he regarded this particular form of preventive medicine as being of the very highest importance to the race.

We have received the following letter with reference to Lord Sandwich's speech:

To the Editor of the BRITISH MEDICAL JOURNAL.

SIR,—It has been impossible to ignore the press notices of the inaugural meeting of the Medico-Psychological Clinic. It is distressing to the committee to find that a great deal of misunderstanding has arisen, and we feel bound, in justice to ourselves, to the pioneers of psychotherapy, and to the supporters of our movement, to dissociate ourselves entirely and absolutely from the occult powers Lord Sandwich claims for himself.

Lord Sandwich has expressed his sincere regret to the committee for the misunderstanding he has caused, and this terminates his association with the clinic and the committee.

We profess nothing but ordinary medical knowledge, acquired in the ordinary way—we have no gift or method not open to every practitioner. It is our belief that the clinic will attract cases of threatened nervous breakdown in a stage at which preventive measures may avert calamity. It will offer a place of study for medical practitioners who wish to acquaint themselves with practical psychotherapy. The whole of the healing art was cradled in superstition. In the minds of many psychotherapy is still tinged with charlatanism, and from this the clinic will help to dissociate it.

We feel sure that the profession will appreciate to the full the difficulties and delicacy of the work we have in hand—the dangers to be avoided, and prejudices to be overcome, and we trust that it will join with us in aiding a work which must of necessity be the object of adverse criticism and unavoidable misconceptions in its early stages.—We are, etc.,

HECTOR MUNRO,
J. M. MURRAY,
JOHN SPENCER,
CONSTANCE E. LONG.

14, Endsleigh Street, W.C.,
Nov. 10th.

THE TUBERCULOSIS CONFERENCE IN BERLIN.

[FROM OUR SPECIAL CORRESPONDENT.]

(*Concluded from page 1240.*)

National Insurance and Tuberculosis.

THIS, the third great discussion at the Conference, was opened by Dr. KAUFMANN, the President of the Imperial Insurance Board, who said that the first State sanatorium was opened in 1895; towards the end of 1912 there were 39 such institutions, with 3,512 beds for men and 1,358 for women. In that year alone over 50,000 cases of pulmonary phthisis were treated at a cost to the State of about a million sterling. Of this large number of patients, 92 per cent. were so much improved that permanent invalidity was not to be feared for them; of the cases treated succesfully in 1907, 57 per cent. were still in a position to earn their own living at the end of 1912. The practical benefits, such as the great saving of expense to the invalidity funds, and the return to health of the patients themselves, were not the only ones, for it was to be remembered that patients who left these sanatoriums to return to their homes carried with them a sound knowledge of hygiene and prophylaxis, which the majority of them could be relied upon to practise and impart to their families. In addition to the institutions for patients with obvious tuberculosis, there were others for those in the first stage, in whom tubercle bacilli had never been found—these were conducted by the insurance authorities under the name of "Forest Homes for Convalescence." Besides the sanatorium and forest homes there were the dispensaries, spread like a net over the Empire; it was their duty to alleviate the hopeless and incurable cases, and to supervise the sanitary conditions of the homes of such patients, and through the Insurance Boards supply what might be necessary in the way of bedding, contributions to rent, etc. At the present time particular attention was being given to such patients as were infectious to their relatives, and too advanced for any hope of improvement by sanatorium treatment. It had not been considered advisable to segregate them in special institutions, and, for the present, they were being tended in the special departments of general hospitals, or in hospitals for consumption where these existed. Tuberculous children were placed in special homes and asylums by the insurance organizations, and those suffering from lupus also came in for a share of insurance benefits, of which the special lupus institute, recently built and opened at Giessen in Hesse, was an earnest of more to come.

The next speaker, Dr. LEE K. FRAENKEL, of the Metropolitan Life Insurance Company of New York, stated that many private insurance societies in his country were beginning to take an active part in the campaign against tuberculosis. His own company, for instance, did not allot all the dividends to its members or shareholders, but reserved a portion for sanitary prophylactic measures among the insured, and he believed that by this means there had been a considerable reduction in the compensation paid for death and disease.

Dr. Fraenkel's point was further emphasized by Dr. KOEHLER, who maintained that it was not only the duty but to the interest of the insurance societies to further such prophylactic measures by all the means in their power, inasmuch as fully 20 per cent. of all the death payments made by them were due to tuberculosis.

Tuberculosis amongst School Teachers.

This subject was introduced by Dr. Altschul (Prague), who deplored the scarcity of statistics and demanded an international census which should embrace teachers both in the State and elementary schools, and be concerned only with cases certified as tuberculosis by medical men. A doctor should be attached to every school of every denomination, and every intending teacher should undergo a qualifying physical examination, which ought to be repeated once a year. Every infected person must be suspended from his office of teaching, and provided for and treated at the public expense until his recovery was assured.

The Mortality of Children from Tuberculosis.

Dr. Behla (Berlin) said that the mortality of children from tuberculosis had not sensibly diminished, although the total deaths in Prussia from the disease since 1876 had been reduced by one half. Frau Dr. Monneron-Tissot reported on the results achieved in the institutions of Aisillons, Lucerne, and other places to which children with a mild tuberculosis or a tendency to the disease had been lodged for four of the summer months annually. This valuable prophylactic measure had now been in operation for six years, and the results produced by good food, fresh air, and sunshine had been remarkable. The average increase of weight was from 5 lb. to 6 lb., the increase of chest measurement 3 c.m. to 4 cm., and the haemoglobin increment 9 per cent. and over.

The Early Diagnosis of Pulmonary Phthisis.

Professor Rosin (Berlin) had some interesting remarks to make on this subject. The physical examination of the apex of the right lung in healthy normal individuals showed in a great percentage a considerable variation in the physical signs, which if discovered in the left apex usually indicated pathological changes. The normal variations, therefore, sensibly increased the difficulty of the diagnosis of tuberculosis in the right apex, and indicated the use of more delicate methods of diagnosis in such doubtful cases. The causes of the respiratory variations were to be sought in the anatomical situation of the right upper bronchus, which had a tendency to curve upwards, and also in the adhesions not infrequently present in this situation. These conditions had more than once been responsible for an erroneous conclusion and mistaken treatment.

Tuberculosis and Pregnancy.

Dr. Credé-Hörda stated that in regard to pulmonary tuberculosis the dangers to women who became pregnant were due to the inefficiency of costal respiration which almost entirely replaces abdominal as the uterus enlarges, and to the absorption of nutrient material from the circulation by the fetus. It would seem, furthermore, that compression of the abdominal circulation by the enlarging uterus led to a diminution of blood supply to the lungs, while Koch and Behring had shown experimentally that the protective substances in the organism were also diminished during pregnancy. The speaker therefore was of opinion that in badly nourished individuals, in the stage of early pulmonary infiltration, the pregnancy should be artificially terminated if only of a few weeks' duration, but should not be interfered with if several months had elapsed since conception, as the resulting loss of blood, etc., would be more dangerous than the natural termination. In well-nourished individuals, on the other hand, in this stage there was no indication to induce abortion, and the course of the disease would not be influenced by allowing the pregnancies to reach full term under careful surveillance in a sanatorium. When abortion was considered justifiable the patient, he thought, should be artificially sterilized at the same time. Women who were in the second stage, with haemoptysis, cavities, infarcts, or infiltration of a whole lobe, were in great danger if they became pregnant. In these cases the indication was, in his opinion, to produce abortion and sterilize as early as possible after conception, but the responsibility for the procedure should always be shared with a gynaecologist. The speaker hoped that before long there would be a special home for pregnant women with tuberculosis.

Treatment of Human Tuberculosis with Reptilian Bacilli.

Professor Moeller (Berlin), after referring shortly to Friedmann's work with turtle bacillary emulsion (see p. 1248 of our last issue), stated that he had tried the effects of a preparation of the slowworm tubercle bacillus on man thirteen years ago, but had abandoned it because he found that his results with Koch's tuberculin were not improved upon, and because he believed that it was very much more dangerous to treat patients with living than with dead bacilli.

In connexion with the Conference Dr. Friedmann and Dr. Schleich demonstrated some cases which had been treated with the preparation in Dr. Krauss's clinic. The latter followed the demonstration with some valuable remarks, the gist of which appears to have been the statement that no ill results from its injection had as yet been notified, and that a thorough and searching investigation of the claims made for it should be undertaken throughout Germany.

Tuberculosis and Milk.

This subject was dealt with by Dr. Heymanns (Ghent). He maintained that cows with tuberculosis of the udder always yield an infectious milk, whilst in those with a "closed" infection elsewhere on the body the secretions were not infected. If the closed lesions of tuberculous cows broke down and became open, not only their own milk might be infected, but also that of all the other cows in the stable. Contaminated milk was by far the most prolific source of bovine tuberculous infection in man, and every infected cow should therefore be absolutely excluded from the milk supply. It had not yet been shown that bovine tubercle bacilli could in ordinary circumstances be converted into the human variety.

Tuberculosis and Compulsory Notification.

Dr. Glasenapp (Aachen) read a paper advocating the compulsory notification of all cases of pulmonary or laryngeal tuberculosis: (1) When tubercle bacilli had been found in the sputum of the patient; (2) when such a patient changed his abode. The notification should be made by the visiting physician through the landlord, or by any other person who had tended the case. A subsequent disinfection, at the public expense, of every room and object that had come in contact with or been used by the patient should be insisted on in every case.

LITERARY NOTES.

According to the *Glasgow Herald* of November 8th, Sir Donald MacAlister, in addition to his many other accomplishments, is a poet. Shortly before he became Principal of Glasgow University, he published a little book of verse which he entitled *Echoes*. The pieces showed not only a facility of versification, but a wide and varied linguistic accomplishment, for the verses are rendered from or into "braid Scots," French, German, Norse, Welsh, Romany, modern and classical Greek, and Low German. A second edition of this interesting little volume is on the point of being issued by Messrs. MacLehose.

The October number of *Lewis's Quarterly List of New Books and New Editions* contains the works which have been published and added to the Medical and Scientific Library during July, August and September. Amongst the new books are Gordon's Hyde Lecture on *The Place of Climatology in Medicine*, and Lee's Bradshaw Lecture on *Incipient Pulmonary Tuberculosis; Diseases of the Stomach*, by G. R. Lockwood; Poynton and Pain's *Researches on Rheumatism*. Amongst well known books which appear in new editions may be mentioned *Gray's Anatomy*, Muir and Ritchie's *Bacteriology*, and Binnie's *Operative Surgery*; this contains upwards of 100 new illustrations.

A collection of Whistler stories, gathered by Don C. Steitz, has recently been published by Harper and Brothers. Among them is the following:

Whistler had a French poodle of which he was extravagantly fond. The poodle was seized with an affection of the throat, and Whistler had the audacity to send for the great throat specialist, Mackenzie. Sir Morell, when he saw that he had been called to treat a dog, didn't like it much, it was plain.

But he prescribed, pocketed a big fee, and drove away. The next day he sent post haste for Whistler. On his arrival, Sir Morell said gravely: "How do you do, Mr. Whistler? I wanted to see you about having my front door painted."

The same story is told of Meissonnier and Nélaton, and doubtless of many others. What tenacity of life there is in these venerable "chestnuts"! It would be as easy to determine what song the sirens sang as to trace them to the fountainhead. The root of many stories which *volitant per ora virom* in club smoke-rooms may be found in the *Golden Ass* of Apuleius, and as this was founded on a Greek original many centuries earlier, it is not unreasonable to suppose that the cave men told these tales to each other on the dark winter nights. It is the same with phrases. "Wait and see" is found within inverted commas in a letter from Mr. Chamberlain to Labouchere in the year 1885!

In the November number of *Knowledge*, Dr. Louis Robinson tells us the story of our chin: why when we lost our big canine teeth, it did not degenerate like that of the elephant, but developed in order to give us room for our tongue, which, when we speak fast, has to make more than five hundred different movements in a minute. He has traced the evolution of the muscles which cause those movements from the time when, as in monkeys, they formed a thin strand seated in a pit, to the present day when they are divided and subdivided and actually attached to two small tubercles of bone specially developed for the purpose. These are absent in the lowest races, in young children, and, in so far as can be ascertained, in deaf-mutes. The evolution of man's lower jaw is also traced, and photographs of a large selection of the hundreds of casts of jaws, taken during the course of Dr. Robinson's researches, are used to illustrate his discoveries.

In the November number of the *Cornhill Magazine* Mr. Stephen Paget, in an article entitled "Lister," compares the face and character of the revolutionizer of surgery with that of Pasteur, from whom he got his inspiration:

> Recalling the two faces, one would like to have a portrait of Pasteur by Rembrandt and a portrait of Lister by Raeburn. There was in Lister's face a wonderful purity, and the utmost refinement of soft lines and delicate colouring; it was full of thoughtfulness, gentleness, and dignity. Often, it had the look of a man rather lonely, rather tired; but tired of hearing his own praises sung, not tired of work and thought: a man who had done too much for the world to care much for anything that the world could do for him. But most of all, it was a quiet face: not impassive or expressionless, for it was quick to show little changes, and he had a way of smiling which had more meanings than are conveyed by laughter: but the quietness of his face, and of his voice, were in the very nature of him. He was not incapable of anger, but he had none of Pasteur's tempestuous wrath with his opponents: he could do all that he wanted with silence, or with a few words of quiet irony or measured censure. Even if he had cared for fighting in debates, print, and correspondence, he would still have denied himself that pleasure: for his work was in the making; he was feeling his way, year in year out, toward the improvement of it. He had set himself to advance the whole science and art of surgery, not by controversy but by incessant observation, experiment, and experience; he must work out his facts quietly, anticipating nothing, always judging his own method, always looking for faults in himself, every inch of the way.

Unlike Lister, Pasteur had a long struggle with poverty. His sensitiveness to criticism was also very keen. When fame came to him his health was already undermined. His stern experience of life was written in deep lines on his face.

The system of leasehold marriage now advocated by some social reformers as a means of regenerating society seems, like most new things, to be of respectable antiquity. Adrien de Valois, called Valesius, historiographer in ordinary of France, and one of the most learned men of the seventeenth century, says that in his day there was in the King's library a contract of marriage made in the year 1297 between two persons of noble family containing the following clauses: (1) The contract was to be binding for seven years; (2) if at the end of seven years the contracting parties were satisfied with each other they reserved the right to renew the lease; (3) if they separated at the end of the period contracted for they were to divide share and share alike the children, male and female, born as the result of their marriage during the said period of seven years; (4) if by chance the number of children was uneven, lots were to be drawn to decide to whom the odd child should belong. It is curious that, in these days, when so much is heard about marriage, limited liability and otherwise, none of the reformers seem to be aware that every conceivable form of arranging the union of the sexes has at one time or another been tried, and monogamy has been accepted among civilized peoples as on the whole the most satisfactory. The existing state of things may therefore be regarded as the survival of the fittest.

Medical writers are often singled out for ridicule for their uncouthness of style. This judgement is rather sweeping, for an impartial judgement would, we think, find the English of the average clergyman or lawyer to be no better. Nor is the pure well of English undefiled to be found in the ruck of novelists and general writers. It would take us too far to discuss the causes of the low position which medical writers as a class hold as stylists. It is alleged that there is little room for style in medical writing. Doctors who speak to doctors have to deal with purely technical matters, and therefore have to express themselves in language not understanded of the people. The barbarous terminology with which they are so often reproached is an inevitable consequence of the birth of new ideas and the discovery of new facts for which new expressions have to be found. That a little more trouble might be taken to construct new terms than laying hold of the first likely-looking word met with in a Greek dictionary and forcibly marrying it to a Latin or possibly even an English word may be admitted. But that does not alter the fact that new terms are a necessary result of the progress of knowledge. Passing from words to diction, we may quote what Sir James Barrie says in *An Edinburgh Eleven*:

> When Mr. R. L. Stevenson's *Memoir* of the late Mr. Fleeming Jenkin was published, Tait said at great length that he did not like it; he would have had the sketch by a scientific man. But though scientists may be the only men nowadays who have anything to say, they are also the only men who can't say it.

That scientific men can write with a sense of literary grace which is not to be found in many professional scribes, is shown by the instances of Huxley, Sir Thomas Watson, and many others. Not long ago Sir A. T. Quiller-Couch, lecturing at Cambridge on the writing of English, quoted the editor of a mining paper in Denver, Colorado as laying down the law that all niceties of language are mere "frills," and that all one needed was to get there, that is, to say what one wishes in one's way. On this "Q" made the comment that just there lay the mischief. They must, he said, carve out the intaglio sharply, neatly, if they would impress its image on other men's minds. And the man who used what he called "jargon" did not get there at all. "Jargon" he described as the use of circumlocution rather than short, straight speech, and of "vague, woolly abstract nouns" rather than concrete ones. As "awful examples" of jargon he chose two from deliverances by the Home Secretary and the Chancellor of the Exchequer. Mr. McKenna gave as a reason for releasing a woman from prison that the attempt to feed her forcibly "would probably entail death in her existing condition." On this "Q" asks if any one would tell him how any one could kill or, as the Home Secretary preferred to put it, "entail death" on a woman in a non-existing condition. More amusing, and also more instructive, is the following extract from Mr. Lloyd George's oratory:

> With regard to Mr. Noel Buxton's questions, I cannot answer for an inquiry which is *of a private and confidential character*, for although I am associated with it I am not associated with it as a Minister of the Crown. . . . Those inquiries are of a *very careful, systematic, and scientific character*, and are being conducted by the ablest investigators in this country, some of whom have reputations of international character. I am glad to think that the investigation is *of a most impartial character*.

It must, says "Q," be a comforting thought that an inquiry of a private and confidential character was also of a very careful, systematic, and scientific character, and, besides being of a most impartial character, was conducted by men of "international character," whatever that might happen to mean. What was an international character, and what would they give for one? That way of talking, he adds, while pretending in the mouths of Cabinet Ministers to be pontifical, is really not reputable speech at all, but jargon—"a timid, a pompous way of walking round the target instead of hitting it." It will be remembered by readers of that delightful book, Cobbett's *English Grammar*, that most of his examples of inaccuracy of style are taken from Kings' speeches.

British Medical Journal.

SATURDAY, NOVEMBER 15TH, 1913.

THE EFFECT OF THE INSURANCE ACT ON COLLIERY AND WORKS PRACTICE IN SOUTH WALES.

THE special difficulties which have attended the operations of the Insurance Act in South Wales have frequently been referred to in these columns, but we make no apology for returning to them, not only because of their urgency, but because careful consideration will show that what affects Wales to-day may easily be a danger in England and Scotland to-morrow.

As in most other mining and industrial areas, a large proportion of the South Wales population has for generations arranged for medical attendance on contract terms, which included the worker and his dependants. Over many a mile of the Welsh valleys such a thing as a doctor's bill was unknown. The doctor was nearly always remunerated by deductions from wages, and the amount was paid to him by the employer. The deductions in some areas were at the rate of so much a week for each worker, but in the majority of areas the deduction was 3d. in the £1 of wages, the doctors thus sharing in the prosperity of the workers as they have always had to share in their adversity. Often during strikes and lock-outs, and such episodes as flooded mines or explosions, the doctor has gone for weeks, and even months, without payment. The poundage system was on the whole satisfactory so far as the money was concerned, but for years a special danger has been growing up side by side with the growth of that labour and socialistic spirit which is so strong among the South Wales workers to-day. The tendency of the workers to demand a greater share in fixing their wages, hours of labour, etc., led in many areas to a demand to control the funds raised by the deductions from their wages, and in this way to control the doctors. In many areas committees of workmen were appointed, who attempted, with varying success, to persuade the employers to hand these funds over to them. Where they were successful in this demand, the committees next claimed the right to appoint and dismiss all doctors and assistants, and to pay them—not according to the number of workmen choosing them—but at fixed and in most cases wretchedly inadequate salaries. Those who best know the cheerless surroundings of the average colliery village—the hard, rough, and often unpleasant work of the colliery and works doctor, and his heavy responsibility as regards accidents, will most sympathize with the resentment which such insidious attacks on the independence of the profession aroused. In some areas the doctors were defeated, and there are several places—such as Aberdare, Rhymney, Tredegar, and Ebbw Vale—where salaried doctors are employed under the control of lay committees. These, being old-established systems, are protected by the "Harmsworth Amendment," and do not come within the purview of this article, except in so far as their existence is no doubt to blame for the spread of the idea of a salaried service. In some few cases the salaries are not inadequate; but it may be said that such is the insecurity of tenure and the feeling of dependence on the whims and prejudices of committees, that there are probably few holders of these posts who would not, if they had the chance, regain their independence even though it entailed a monetary sacrifice.

In other areas the profession has succeeded in warding off the imposition of lay control and salaried appointments, but only at the cost of increasing vigilance and strenuous fighting. It may be said that never since the Association was reorganized and the ethical machinery and Warning Notice established has the South Wales and Monmouthshire Branch been free from a fight against one or more of these pernicious schemes. The doctor in most parts of England and Scotland has little idea of the feeling of dread—sometimes almost of despair—with which the Welsh colliery doctor views the miners' "schemes." Just before the Insurance Act came into force the profession seemed to have got into a better position. Except with regard to the few well-established schemes, the workmen were finding it very difficult to get medical men to take these appointments. The Insurance Act has, in a totally unexpected way, greatly intensified the difficulties of the situation, and rendered the establishment of schemes more easy. This is due to the attitude taken up by the Welsh Commissioners in regard to such schemes, an attitude which it is well to note has received no encouragement from the English or Scottish Commissioners. The Welsh Commissioners have, however, as has often been explained in the JOURNAL, interpreted Clause 15 (3) of the Insurance Act, 1911, in a way which entirely discounts the promise so often made or implied by the Chancellor of the Exchequer when he was endeavouring to persuade medical practitioners to accept service, namely, that where the panel system was accepted and worked properly those taking part in it should have the preference, since it was, so to speak, the normal system. Where schemes are in operation the profession is undoubtedly at a serious disadvantage. The scheme can use the insurance money in bulk in a way which is not open to the individual doctor. The scheme can use the powerful pressure of the trade union. It can and does canvass. It has no scruples about medical etiquette. It is a purely business affair dealing in cheap medical attendance.

The attitude of the Welsh Commissioners has led to an epidemic of schemes based on the desire to get hold of the money paid by Insurance Committees in respect of insured workers, and use it for subsidising the medical attendance of the dependants. There are several schemes in operation to-day in Wales in which a number of insured persons and their dependants are being attended by salaried doctors, under the absolute control of a lay committee, at a total cost of little if anything more than the money paid by the Insurance Committee on behalf of the insured workers alone. The men's officials collect the names of a large number of workmen, who are tempted by the chance of getting their dependants treated for little or nothing. They then apply to the Insurance Committee to be "allowed to make their own arrangements" collectively, and no difficulty has been placed in their way by the Welsh Commissioners, and certainly not by those Insurance Committees which are dominated by the miners' interest. It is quite easy to figure out that

if, say, 4,000 workmen can be got to come into a scheme of this kind the scheme will have a handsome nucleus of some £1,400, which, with little or no addition, may well be used to secure a salaried service, of a kind, on the workmen and their dependants also. Is it surprising that the temptation which has been almost thrown in their way by the Welsh Commissioners has proved very attractive to bodies of men who lay much more stress on getting doctors under their control and getting them cheap than on offering such terms as will tempt energetic and competent men to take up their abode in the uncongenial surroundings of the average Welsh mining or industrial district? It is, however, an injustice to blame the workers as a body except for their apathy. It is difficult for bodies of untrained laymen to put a proper estimate on skilled professional work. Price rather than quality is very likely to appeal. Only wider experience will teach them that an indifferent medical service can never be really cheap. The initiative in these matters nearly always comes from the trade union officials, few in number but very influential and greedy of power. The general body of workers simply acquiesce. The so-called "mass meetings" and "ballots" by which many of these schemes have been jerrymandered into existence are often ludicrous in their unreality.

It is a sorry story, only redeemed by the grim determination of many of the best all-round colliery doctors in Wales to be starved out of the principality rather than submit to the imposition of committee control and salaried appointment. Stories could be told of battles at heavy odds which are greatly to the credit of our Welsh members. Throughout the valleys of Glamorganshire and Monmouthshire in particular the fight is now going on, and will be determined largely by the success or otherwise of the attempts now being made by some of the schemes, which are in a moribund condition, to secure a wholesale transfer of patients from individual doctors to themselves. There is no doubt that strong personal pressure is being brought to bear on many a workman who, if left alone, would prefer to retain the services of his old family doctor. There is, we regret to have to add, little doubt also that doctors connected with some of these schemes are laying themselves open to charges of complicity in canvassing, which the Association will not fail to press on the attention of the General Medical Council if proper evidence is forthcoming. It will probably be news to some to be told that in a considerable number of districts, owing to the resistance to the imposition of a scheme, the doctors have been unable during the whole of this year to secure payment of any kind for the dependants, and have had to live on the moneys received from the Insurance Committees in respect of the insured workers.

We wish to enlist the sympathy of members of the Association on behalf of their Welsh colleagues, for they well deserve it, but we wish also to point out that such an example as the Welsh "scheme" affords is very likely, if the schemes prove successful, to be a temptation to collective bodies of English and Scottish industrial workers.

It is essential, therefore, that these schemes should be defeated, in the interest both of the public and of the profession. It must be plain to every member of the profession that self-respecting medical men of the best type—and the best type is needed in these industrial areas—cannot be induced to accept the humiliating conditions, the precarious tenure, and the insufficient remuneration offered by most of these schemes. Therefore the medical service for these bodies of workers must inevitably deteriorate. No responsible person with a knowledge of local conditions could encourage a promising young practitioner to accept a post in connexion with one of these schemes. There are plenty of other posts far more attractive. The inevitable deterioration in the professional and social status of the Welsh colliery surgeon is a lamentable prospect from the professional point of view, but it promises to be disastrous to the workers of Wales. A heavy responsibility for encouraging this state of things will rest on the workers' leaders who are favouring these schemes, but a still heavier responsibility lies at the door of the Government officials, who have weakly given way to the ignorance and greed for power of these leaders, although they must realize that this weakness must ultimately be detrimental to the insured and their dependants. It is not so many years since young members of the profession were "warned off" going into the Army Medical Service, with the result that that service went steadily down in public and professional estimation until the War Office took action. Is this history going to repeat itself in connexion with Welsh industrial practice? Will those who have the power to prevent it take action now or deliberately ride for a fall?

THE SCIENTIFIC WORK OF THE ASSOCIATION.

THE Council, at the suggestion of the Science Committee, has issued a circular letter to the honorary secretaries of Divisions and Branches in the United Kingdom inviting them to consider the ways in which the scientific work of the Association at the periphery can be extended. The last Annual Representative Meeting asked the Council to increase its efforts to encourage the Divisions to hold more scientific and social meetings, and the circular letter now issued is the first step taken in fulfilling this instruction. It is suggested that Branches should form Science Committees in their areas to organize the scientific meetings of the Branches and to assist the Divisions in carrying out their scientific work generally by advising as to the best way of arranging for such meetings, and in particular by preparing lists of speakers willing to give addresses or demonstrations on special subjects, instituting special local inquiries, as, for example, into the hygiene of local industries and conditions, and, where deemed desirable, establishing courses of post-graduate lectures.

A good deal has already been done in many Branches in this respect, and the present action of the Council is intended not at all to disturb the arrangements which have proved efficient, but rather to encourage those Branches and Divisions which have not yet given the subject full consideration to take it in hand. The Edinburgh Branch has for some years held clinical meetings which occupy a whole day and have been very well attended. The general plan of these meetings has included a loan exhibition of pathological specimens, at which the lenders attend and give explanations—demonstrations chiefly of surgical cases—during the afternoon, followed by a clinical meeting at which cases are shown and briefly explained, the whole winding up with a dinner in the evening, the scientific and social aspects of the Association's work being thus very suitably combined.

In the North of England Branch the lead has been taken by the Newcastle-on-Tyne Division. From a

memorandum drawn up by Mr. R. J. Willan, F.R.C.S., Honorary Secretary of the Division for scientific meetings, we learn that such meetings have been held by the Divisi for the past ten years. For the first five years an all-day meeting was held at the Newcastle-on-Tyne Infirmary about the end of June in each year, and its popularity encouraged the Division in 1908 to hold monthly scientific meetings throughout the winter; their success has led to their being continued each year since. The general plan is that the meeting lasts from 3.15 to 6 p.m., and the time is filled by five demonstrations, each lasting half an hour, the proceedings being interrupted for a quarter of an hour for tea. The meetings are managed by an executive committee consisting of four members—one each for medicine, surgery, special departments, such as throat and ear, ophthalmology, gynaecology, and dermatology, and one for pathology, with the honorary secretary. This committee draws up a provisional scheme, choosing subjects of special interest at the time which lend themselves to clinical or pathological demonstration, and then selects the most suitable person to give each demonstration. As a rule, about one-third of each meeting is given up to medicine, about one-third to surgery, and about one-third to special departments, but the whole of one meeting held in the College of Medicine is devoted to pathology. Each demonstrator is kept strictly to his allotted time of thirty minutes, and is asked to devote ten minutes to a general explanation, and the remaining twenty minutes to demonstrating. Hitherto one meeting has been held at the College of Medicine, Newcastle-on-Tyne, and the other four at the Royal Victoria Infirmary. This year it has been found desirable to increase the number of meetings to six by arranging for one at the Northumberland County Asylum, Morpeth, when the medical superintendent, Dr. T. W. McDowall, will demonstrate a series of cases illustrative of incipient insanity. At the other five meetings, one of which will be held at the College of Medicine and the remainder at the Royal Victoria Infirmary, the subjects of the demonstrations vary from a demonstration of the Wassermann test and another on acidosis in diabetes and other diseases, to the diagnosis of intestinal obstruction and the treatment of simple fracture, and again from experience of the Insurance Act to hospital management. The working out of the detailed arrangements to ensure the smooth working of the demonstrations throws a great deal of responsibility upon the honorary secretary, but he has been rewarded by the interest shown in the meetings and by the large attendance. In future it may be possible to arrange for some of the clinical meetings hitherto held at the Royal Victoria Infirmary, Newcastle-on-Tyne, being held in other towns within the area of the Branch, and in that case part of the responsibility of providing interesting demonstrations would be put upon the shoulders of the members of the profession in the locality.

The Birmingham Branch has for a good many years past held once a month an afternoon clinical meeting at which short papers are read and demonstrations given. These meetings are well attended by members residing not only in Birmingham itself but in the Divisions included in the Branch. In addition the Branch has a clinical and pathological section which meets in the evening once a fortnight during the session; it is open to all members of the Branch, but owing to the hour of meeting is mainly attended by those residing in Birmingham.

Many other Branches and Divisions, as reports of their clinical and scientific proceedings published in the Journal from time to time prove, give a great deal of attention to arranging clinical meetings, and it is often deemed desirable, especially where the work is organized by the Branch, to arrange to hold these meetings in different towns in the area following a more or less regular order.

The different ways in which the objects in view have been attained in different localities are sufficient proof that the utmost elasticity is desirable, and is allowed under the rules of the Association; the large measure of local autonomy permitted, and of local initiative encouraged by the rules of the Association amply provide for this elasticity. The needs of different districts vary, and the ways in which they may best be met still more.

As will be observed, the managers of these meetings, both in Newcastle and Edinburgh, have settled down to the plan of arranging a series of practical demonstrations. This is quite in accord with the marked tendency towards objectivity to be observed in the trend both of modern medical education and in the work of medical congresses, whether general or special. The didactic lecture and paper is giving way to the practical demonstration. Medical practitioners engaged in every class of practice more an more find it necessary to do things—to undertake detailed physical examinations demanding manipulative skill, or to make chemical and bacteriological investigations—and they want to see how the manipulations and processes are carried out. The Association, by its annual meetings, which have themselves experienced the effect of this modern tendency, has for many years afforded most valuable opportunities for seeing as well as hearing to those of its members who find it possible to attend them, but all members cannot, and the Branches and Divisions can fill the gap and extend the work by bringing the information and experience, as it were, to a man's door.

To work out an adequate scheme and to keep it going requires some special organization, and the plan evolved after much experience at Newcastle seems to afford a useful model. Any scheme must enlist the sympathies and energies of both seniors and juniors, as has been the case in Newcastle, where the sympathy of Mr. Rutherford Morison and other senior members of the medical school has been given form and substance by the energy and enthusiasm of Mr. Willan.

RECORDS OF PRACTICE UNDER THE INSURANCE ACT.

On several recent occasions reference has been made to the importance of medical men whose practice includes attendance on insured persons keeping a record of all work of this kind they do, but the matter is of such importance that we recur to it again. The record should not only be accurate, but full—that is to say, it should include every item of work of whatever nature which is necessitated by the acceptance of a contract of service to give medical benefit under the Insurance Act. The keeping of records is not only part of the contract into which every panel practitioner has entered, but it is very much to his own interest that it should be strictly observed.

The completeness and accuracy of these records are, for certain definite reasons, of very great importance, primarily to those who are co-operating in giving effect to the Act, but indirectly to the whole of the medical profession. It is fairly certain that sooner or later—and probably sooner rather than later—attempts will be made in one of two directions—

either to reduce the capitation fee at present paid, or to force panel medical men to attend the dependants of insured persons for some trifling addition to it. It is conceivable that these attempts will be unaccompanied by any serious endeavour to prove their justice, but probably they will be more or less directly based on statistical data derived by the official actuary from the records which reach the hands of the Insurance Commissioners. In anticipation of such actuarial report, pessimists will, no doubt, be disposed to argue that it does not matter what it suggests, since the events of last year prove that interested persons will probably not scruple to make deductions from the figures which cannot really be supported from them, and are not drawn by the actuary himself. Optimists, on the other hand, may urge that panel medical officers need not necessarily accept any conclusions based upon the actuary's statistics, whether rightly or wrongly, nor, whatever the arguments adduced, allow themselves to be forced into agreeing to accept terms which do not seem to them fair. Nevertheless it remains true that it is of great importance that the statistics not only shall present as few openings as possible for the drawing of inaccurate conclusions inimical to medical men, but shall also make it quite obvious to any unbiassed individual that the aggregate amount of work done by a panel medical officer must be—as in fact it is—very great. This, however, can only be the case, or in other words, the statistics will only on analysis yield results of this character, if the records placed in the hands of the actuary are absolutely complete, for the actuary, though he will do his work with perfect honesty according to the rules of his profession, will presumably be precluded from making any allowance for work which is not recorded, even when other sources of information lead him to believe that it must have been done.

The Plender report is almost forgotten, and it has, indeed, no direct bearing on the new conditions, but it may be taken as an illustration of the kind of way in which an actuary will handle the statistics of attendances and payments now accumulating for the information of the Insurance Commissioners. It is the business of an actuary to analyse the statistics put before him without reference to extraneous considerations, and it is not part of his duty to make allowances for the indisposition of hard-worked men to keep complete records. It is, of course, conceivable that such allowances may be made by the Commissioners, or by responsible Ministers, when they come to consider the actuary's report, and to put upon it their gloss in appealing to the public and to Parliament, but the history of the use made of the Plender report offers no support for this belief. On the contrary, it rather suggests that no such allowances will be made, and that in the interpretation of the figures the construction least favourable to the medical profession will be adopted and noised abroad in the press and from the platform. There were fallacies in the Plender report obvious to medical men, but it had the merit from the point of view of friendly societies and their allies of making certain deductions apparently indisputable. It covered all the medical work ostensibly done in certain towns and their immediate neighbourhood by the practitioners residing therein, as also by public institutions and Poor Law medical officers; in fact, it purported to include the whole of the medical services received by the individuals forming the population of these towns, with the exception of such as were rendered by medical men living in other areas. It classified the work done by medical men under the following headings: (*a*) Visits to patients' houses and attendances at surgeries; (*b*) operations and other services (including maternity) for which special fees were charged; (*c*) certificates and reports; (*d*) work done as medical officers of health, as district medical officers, or tenants of part-time hospital appointments; (*e*) in connexion with inquests; (*f*) in various miscellaneous capacities, and (*g*) under capitation contracts. In respect of the work done at patients' houses or at doctors' surgeries, the number of visits and attendances was supplied, but the return as a whole considered the work solely from the point of view of the income which it brought in, less a deduction for bad debts. The actuary set out separately the receipts from persons inside the towns and those outside, and also supplied information as to the cost of drugs, the salaries of assistants, of dispensers and nurses, and various other items which would have to be subtracted in order to reach a conclusion as to what was the net income of all the medical men in these towns before charging rents, rates and taxes, and the expenses of locomotion, but abstained from suggesting any conclusion in regard to most of this material. In respect, however, of the gross income derived from the populations, the actuary estimated that after making a deduction for bad debts, it was equal to 5s. 6d. a head in 1910, and 5s. 7d. in 1911, and he was careful to emphasize the fact that in the case of approximately 59 per cent. of the gross population of all five towns, the charges which were paid, or should have been paid, included the cost of medicine. In regard to income arising from certain items of work, the actuary was still more specific. Taking that derived from contract work and adding to it that from visits to patients' houses and attendances at surgeries, he suggested that after making a deduction for bad debts, the gross income of all the medical practitioners in the five towns was equal to 4s. 1¾d. a head of the population. The implied suggestion, of course, was that since, when all classes of patients were taken into consideration, the income of the medical men in these towns from the sort of work now covered by insurance payments was only about 4s. 2d. a head, the capitation fee then being offered for attendance on insured persons was ample.

In any statistical analysis of the amount of medical benefit given under the Insurance Act, the conclusions of the actuary may very likely be used to prove, if possible, the same fact the other way about—namely, to show that in respect of the payments made the work that has actually been done has been small. The Commissioners will be able to tell the actuary the gross amount that has been paid, and it rests with panel practitioners to see that the amount is correctly distributed over the true number of attendances, using that term to include every visit of the doctor to the patient, or of the patient to the doctor. In dealing with their private patients many practitioners "throw in" many small services which they render them in the course of the year, but in dealing with insurance patients nothing at all should be thrown in. Even the shortest interview with an insurance patient—for the purpose, for instance, of renewing a certificate, or of repeating advice already given—which involves professional responsibility of any kind whatever should be included in the record of work done, and duly entered.

Another point worth noting is that in any report on the returns made under the Insurance Act it will not be possible for the actuary to show the aggregate income of all the medical men in any single town, much less that of all the medical men in several towns. This being the case, those who use any such

report as we are contemplating, for the purpose of fighting the medical profession may very probably refer back to the Plender report with the object of suggesting that, apart from their income as panel practitioners, medical men who are in charge of insured persons receive considerable sums from other sources and so influencing public opinion against whatever medical claims may then be made. This is a further reason why panel practitioners should do everything in their power to secure that any fresh actuarial report shall give as true and complete an account as possible of the labour and responsibility thrown upon them, and thus shame their opponents out of any attempt to make out that they are adequately, or more than adequately, remunerated.

NEW REGULATIONS FOR MEDICAL BENEFIT.

THE full text of the new draft regulations which the Insurance Joint Committee, acting conjointly with the Insurance Commissioners, under the powers conferred on them by the National Insurance Acts, 1911 and 1913, have issued this week, is printed in the SUPPLEMENT, together with the draft form of agreement between the medical practitioners and the Insurance Committees, in districts where the method of payment selected is by capitation. The explanatory memorandum issued by the Joint Insurance Committee is also reproduced. The new draft regulations differ materially in order and arrangement from the regulations now in force, which were issued last December, and differ also in many points in substance. All the documents have been subjected to a detailed scrutiny by the special Subcommittee appointed by the Insurance Act Committee, and a communication will shortly be addressed to the Divisions and Local Medical Committees. Representations will also be made on certain points to the Insurance Commissioners. Meanwhile we would strongly urge all practitioners, especially those who are working under the Insurance Acts, to read the Commissioners' explanatory memorandum printed at p. 423 of the SUPPLEMENT, and to study most carefully the terms of the proposed agreement, comparing it with the relevant clauses of the draft regulations.

PANEL COMMITTEES.

ONE of the minor peculiarities of the National Insurance Act is the extent to which it necessitates the use of the word "committee," and probably in no other connexion has this term been so hard worked. In the Act and regulations alone it is applied to some half-dozen different bodies, and in any discussion ranging over the general subject of health insurance its repeated use is so inevitable that only by close attention on the part either of the speaker and audience, or of writer and reader, as the case may be, can confusion as to the particular committee in question be avoided. The newest body to bear this title is the "Panel Committee." The regulations as to the institution of these new committees, published in the SUPPLEMENT to last week's issue, were considered by the Insurance Act Committee of the Association at its last meeting, and this week the Medical Secretary has addressed a letter on the subject to the secretaries of all Divisions, and of Local Medical Committees in England, Scotland, and Wales. The question of the constitution of the Panel Committee, of the work it is to do, and of the method of its election, is of considerable importance to all medical men, and there is no doubt that the fashion in which the Commissioners have hustled them in dealing with it will be resented. As things are, medical men in all insurance areas will have to act with promptitude if they are to take any practical part in the formation of these committees, of which 140 seem to be in view for England and Wales. Any registered medical practitioner may be nominated as a candidate for membership of a Panel Committee, but three-quarters of those elected must be panel practitioners, and only panel practitioners can vote for candidates. The Commissioners seem originally to have intended that the membership of the Panel Committee should be determined at an election conducted by themselves, but this plan has probably proved nugatory in most areas, for the regulations made it necessary that applications for nomination papers should be received by the Commissioners on or before last Monday (November 10th), and at that date a large proportion of all panel practitioners had probably not had time to make themselves acquainted with the conditions of election. The regulations, however, also allowed of the Panel Committees being constituted by other methods if schemes relating to them were submitted to the Commissioners by November 20th, and approved by them, and it is to be hoped that in all areas full advantage will be taken of this possibility. A scheme forwarded for the approval of the Commissioners must be submitted by not less than one-third of the panel practitioners in the area, or by twenty of them, whichever is less, and must be accompanied by approved evidence that the scheme has been brought to the notice of the new body of electors in the area. It is desirable that the membership of the Panel Committee and of the Local Medical Committee of any area should be as far as possible identical, for, though the work to be done by Panel Committees is in part not work hitherto done by Local Medical Committees, there are many points upon which both must be consulted. Moreover, the Commissioners possess the power, if they think fit to exercise it, of extending the duties of a Panel Committee, and it is conceivable that they might do so in a way which, if there were great differences in the personnel of the committees, would render clashing of their work possible. As will be seen by a study of the new draft regulations published in the SUPPLEMENT this week, both the Panel Committee and the Local Medical Committee must be consulted by the Insurance Committee as to the terms of the draft agreement proposed to be made with medical practitioners willing to undertake to give medical treatment under the Act; as to any alterations in the terms of service; as to the drug tariff and any revision of it; as to any income limit proposed to be fixed; and as to rules with regard to the administration of medical benefit. Both committees have also the right to make representations to the Insurance Commissioners with respect to all the arrangements proposed to be made by an Insurance Committee for the administration of medical benefit. The Panel Committee will have power, by a notice in writing to the Insurance Committee, to dispute the right of any insured person to receive medical benefit under the arrangements made by the committee on the ground that the income of that person exceeds the income limit, and that he is not entitled to be exempted. Arrangements for assigning an insured person to a practitioner must be made with the Panel Committee by the Insurance Committee. With regard to accounts, where a capitation system has been adopted, the Panel Committee must be consulted as to the payments made to the practitioners on the panel, and will have power to inspect and revise accounts, and to investigate any alleged excessive ordering of drugs. The Panel Committee will be represented on the Medical Service Subcommittee and on the Joint Service Subcommittee. This new subcommittee is composed of medical and pharmaceutical representatives and representatives of insured persons, with a neutral chairman and vice-chairman; to this committee will be referred any matter which has been referred to the Medical Service Subcommittee and, in its opinion, involves questions relating to a person supplying drugs or appliances or to a practitioner on the panel. The Panel Committee will also have certain powers with regard

to inquiries relating to practitioners; it will be entitled to make representations to the Commissioners, calling upon them to hold an inquiry relating to a practitioner, and will be entitled to appear at the inquiry by its clerk or any other person duly authorized for the purpose. It will be seen also that the Panel Committee is to be consulted in regard to any further records which it may be proposed to require practitioners to keep. With regard to the election of Panel Committees it is to be noted that in areas in which the proportion of panel to non-panel practitioners on the Local Medical Committee is already three to one, schemes for the appointment as members of the Panel Committee of the members of the Local Medical Committee *en bloc*, either by postal vote or by a vote taken at a meeting, could be put forward. In areas in which the proportion of panel to non-panel practitioners on the Local Medical Committee is not at present so high, the same principle could be carried by co-opting a sufficient number of members to bring up the proportion to the required height. If the constitution of a Local Medical Committee does not allow co-option, it can be represented to the Commissioners that it is desirable that the two committees should be similarly constituted, and that when the present Local Medical Committee goes out of office—which will usually be at the end of this year—it is proposed to bring its composition into line with the required composition of a Panel Committee. In areas in which none of these plans is deemed suitable, and where ordinary elections are to be held—an adequate number of nominations having been duly forwarded by November 20th—panel practitioners would be well advised to secure election of a certain proportion of their non-panel colleagues, choosing as far as possible those who are already serving on the Local Medical Committee. When, again, the panel in the area is so small that its members *ipso facto* become under the regulations the Panel Committee for the area (this is the case, subject to the approval of the Commissioners, when the total panel does not exceed twenty practitioners), the Committee should be urged to exercise its right of co-opting members to the extent of one-third of its number, and select men who are on the Local Medical Committee. Finally, it is to be noted that the regulations do not bind the Commissioners to proceed with ordinary elections, even when an adequate number of nominations have been received, but leave it open to them to substitute any schemes of election which are submitted to them and of which they approve, and that in regard to areas from which emanate neither an adequate number of nominations, nor alternative schemes of election, they can arrange for the work of the Panel Committee to be done by a body of their own choice.

THE GERMAN INSURANCE DIFFICULTY.

SINCE the special representative meeting of the German medical profession on October 26th an attempt has been made by the managers of the insurance societies to influence public opinion, through the channel of the daily press, against the doctors, but their appeal does not seem to have been either very well timed or ingeniously carried out. No fresh development has taken place, and the position remains, that the profession of Germany as a whole has undertaken to fight the societies to the bitter end. The exceptions are Berlin, Hamburg, and Dresden, where the medical organization does not feel strong enough to face the opposition of the societies, and in Würtemberg, where the doctors have already succeeded in getting all that they have claimed. Dr. Mugdan, a member of the Reichstag, writes in the *Vossische Zeitung* of November 4th, laying stress on one aspect of the matter, noted in our previous report, but to which he thinks the German public has not attached sufficient importance. The new Imperial Insurance Order contains a paragraph (370) which provides that in the event of any societies failing to come to a satisfactory agreement with a sufficient number of doctors, the insured may receive a lump sum of money in lieu of medical attendance and drugs, etc., or of medical attendance alone. The societies would like the insured to believe that they would not suffer from this arrangement; but Dr. Mugdan shows that a careful analysis of the new paragraph makes it quite clear that only under the most favourable circumstances will the insured receive as much as 6 marks a week during illness; that there are certain somewhat complicated formalities to be fulfilled; that the money will only be paid out on a certain day and at a certain time of day, and always for a period which has elapsed. It will therefore become necessary for the sick person to find money to pay the doctor before he gets the money back from the insurance society, either in part or in full. Dr. Mugdan suggests that the doctors will certainly require immediate payment in all cases save emergencies, and thinks that they might follow the example of the lawyers, and demand part payment in advance as a sign of good faith. It is possible for the societies to attempt to injure the doctors by referring a very large proportion of patients to hospitals for treatment. What the hospitals and other charitable institutions will say to this, experience alone will show, as the contributions of the insured patients do not cover the costs of such patients. Dr. Mugdan considers that the doctors would do fairly well by the arrangement contained in paragraph 370, but that the patients would soon find out the disadvantage.

THE PART OF MEDICINE IN HISTORY.

THE fact that medicine may throw valuable sidelights on history by showing how the acts of rulers are determined by their bodily condition has frequently been asserted in these columns. As Carlyle somewhere says, it is all very well to exhume a document signed "Carolus Rex," but what a true historian would like to know is the condition of health and temper, as well as more directly political circumstances under which "Carolus Rex" appended his sign manual to letter or deed. Historians in general take a vast amount of trouble in unravelling Court intrigues, but miss the important part played by the health of monarchs and ministers. Lord Chesterfield said with truth that great events are often really due to much smaller causes than the jealous regard of writers for what is called the dignity of history allows them to admit. M. A. Corlieu tells us that in 1871 when passing through the galleries of the Louvre he stopped by chance before the bust of Charles IX by Germain Pilon. This gave him the idea of seeking for the causes of the death of that monarch with the special purpose of discovering whether the bloody sweat was a legend or a fact. From the official records of the autopsy M. Corlieu was able to establish that this bloody sweat was in fact purpura haemorrhagica, and that the king died of phthisis. M. Duruy, to whom he sent his memoir, said in his reply: "Good service would be rendered to us historians if all the *tragical* deaths of important personages were made the object of serious medical study. As regards Charles IX I have substituted in my book phthisis for the famous bloody sweat. This is more prosaic, but the official record of the autopsy does not allow us to maintain the tradition." The correction does not seem to have been made, however, but it is interesting to find a man like Duruy, who was Minister of Instruction under the Empire, as well as a distinguished historian, expressing the opinion that "pathology lies at the bottom of a part of history." Encouraged by this opinion Corlieu made a number of researches, the results of which he embodied in a book on the deaths of the Kings of France from Francis I to Napoleon III, published in 1892. Dr. Cabanès some years ago published a very interesting book on mysterious deaths in history, and more recently Dr. James Rae has made a careful study of the deaths of

English kings. We need only refer to the attention that has lately been given to the death of Napoleon. But medical histories of the lives of those who have in any way influenced the destinies of nations would be more valuable than mere records of the last illness of princes and potentates. A knowledge of the part played by disease in the doings of the men who make history would reveal the secret springs of many actions which are not understood by the ordinary historian.

PSYCHOLOGY IN EUGENICS.

At the November afternoon meeting of the Eugenics Education Society, held at the Grafton Galleries on November 6th, Mr. W. MacDougal, Reader in Mental Philosophy at the University of Oxford, read a paper on psychology in the service of eugenics. Major Leonard Darwin was in the chair. Mr. MacDougal said that, although it would be generally conceded that eugenics had to find one of its principal supports in general biology, it had to rely also upon psychology, conceived as the empirical study of the mind. Hitherto eugenics had been rather backward in proclaiming psychology as its nearest relative among the sciences, but that was because psychology was still in the early stage of its development. The study of the peculiarities of the individual mind was the branch of psychology from which eugenics had most to hope, for it was the study of this branch—psychognosis or individual psychology—which gave a knowledge of mental heredity. Francis Galton himself had realized the necessity of the study of the mental qualities of individuals. There were three principal directions by following which mental tests could give the exact knowledge needed as a basis of eugenics. One such experimental method might be applied to the problem of analysis of the complex mental powers used in ordinary life. Another was the application of mental tests for the purpose of detecting, and as far as possible measuring, any differences of mental endowment there might be between various classes or strata of the population. The third principal line of application of psychological experiment in the service of eugenics was the direct attack on the problems of mental heredity. These three lines of investigation would converge more and more, would mutually aid one another, and in a few years would achieve results which would give a firm foundation in fact, the thing which was most needed as the basis of eugenics. At the close of the lecture, Major Leonard Darwin in a short speech referred to a recent report issued by the Home Office, in which the conclusion was drawn, after a series of psycholgical tests of criminals, that the main differentiation between criminals and other members of the community lay in defective intelligence. He looked to such psychological tests becoming, as the lecturer had suggested, of the greatest importance in criminology in connexion with eugenics, and he hoped that they would help to distinguish between criminals who might be released with safety, and with hope of reform, and those who were absolutely destined to return to prison if once they were allowed to go free. It might be worth while to consider the devising of some plan of segregating criminals on whom punishment had no deterrent effect from those who might be expected to reform.

SIR THOMAS CLOUSTON ON ALCOHOLISM.

On November 3rd Sir Thomas Clouston delivered the fifth Norman Kerr Lecture in the hall of the Royal College of Physicians, Edinburgh. Dr. Leslie Mackenzie, in the absence of Dr. Mary Scharlieb, president of the Society for the Study of Inebriety, occupied the chair, and the lecturer took for his subject "The Psychological and Clinical Aspects of the Study of Inebriety." The lives of the great men of the past did not, he said, give much guidance in regard to the moderate use of alcohol; it was known to Socrates, Solon, Alexander the Great, Moses, Julius Caesar, St. Paul, Mahomet, Francis Bacon, Shakespeare, Goethe, Napoleon Bonaparte, and Darwin, and was in common use in their time; none of them except Mahomet abstained from its use, and none but he laid down any definite rules against it. There was no reason whatever to suppose that Homer, Goethe, or Shakespeare were in the least aided in their greatest efforts by the physical stimulus of wine; neither were Milton, Wordsworth, Tennyson, Browning, or Sir Walter Scott; but "given a certain quality of brain, with keen imagination and high artistic faculty, it needs great audacity to contradict the experience of Burns, Edgar Allan Poe, Swinburne, and Omar Khayyam, as to the stimulating effects of alcohol on poetic fire and conscious happiness." The psychological examination of the effects of alcohol showed that it tended to affect the emotional and the volitional faculties more than the intellectual; further, the habitual use of alcohol in any degree beyond the strictest moderation certainly tended to bring on the signs of old age before their time. There was an extraordinary want of knowledge among the public, and especially among young men of all classes, as to its real effects, and as to the risks which should make men careful about it. Sir Thomas Clouston said that the statistics at Morningside Asylum showed that better social conditions lessened excessive drinking; at any rate, hurtful drinking was more common among the poor than the rich, and added this pregnant remark: "A certain poorness of brain quality was largely the cause both of the poverty and of the excessive drinking in many of the cases." From amongst a number of practical conclusions which Sir Thomas Clouston drew, the following may be picked out: Anything approaching excess in the use of alcohol was always deteriorating and dangerous to body and mind. The chief action of alcohol was always on the higher and more regulative of the mental faculties; it affected the finer muscular co-ordination even in moderate doses; its pleasant personal and social effects could only be safely obtained in fully developed healthy men with a reasonably good nervous heredity, and taken in strict moderation; to the female sex it was especially dangerous; the period of adolescence was also a danger-time, and it should not be taken then at all; a nervous constitution of brain and a bad nervous heredity implied a special susceptibility to its evil effects, and persons, therefore, with this constitution should practise total abstinence; and mental disease and defect would diminish if alcoholic excess did not exist. In relation to medicine, alcohol in excess predisposed to and caused many forms of bodily disease and reduced the chances of recovery in all bodily diseases, whilst certain of its bad effects on the brain were probably harmful to descendants. Scientific facts suggested that there would be a reduction in the mischief produced if no drinks containing more than 18 per cent. of absolute alcohol were used except for medical purposes. New legislation was required for those people who suffered from an uncontrollable craving for alcohol; it was also needed to reduce the temptation to its use. Sir Thomas Clouston closed with a word or two of hope. The excessive use of alcohol had undoubtedly diminished in the last hundred years among the educated, the reasonable, the well-off, and the self-respecting parts of the community in all civilized countries. On the motion of the Master of Polwarth, seconded by Sir Alexander Simpson, a vote of thanks was accorded to Sir Thomas Clouston for his lecture.

BACK-TO-BACK HOUSES.

One of the most important alterations in the law relating to the housing of the working classes which was made in the Housing, Town Planning, etc., Act (1909) was in the procedure relating to the closing of uninhabitable

dwellings. Under the Housing of the Working Classes Act (1890) a closing order could only be made by a court of summary jurisdiction, and an appeal against such an order could be made at quarter sessions. Under the Act of 1909, however, a closing order can only be made by a sanitary authority, from whom an appeal may be made to the Local Government Board. During the year ending March 31st the Board considered 75 appeals relating to 343 houses. Of this number 44 were abandoned, 3 were upheld, and 12 relating to 63 houses were dismissed after inquiry. An important decision has recently been given by the Board with respect to thirty back-to-back houses in the rural district of Chesterfield which had been formally closed by the district council on the representation of the medical officer of health, Dr. Herbert Peck. The requirements of the council to make the dwellings habitable were the conversion of the privies to water-closets, the paving of the back-yards, the general repair of the houses, and the making of each pair of front-and-back houses into one through house. The owner of 14 houses was willing to comply with all the requirements except that of making the dwellings into through houses, though he offered to put in what he considered to be efficient ventilators. The district council would not accept this offer, and the owner appealed to the Local Government Board against the order of the Council. An inquiry was held in July on behalf of the Board, and evidence was brought by the owner as to the acceptance by the Sheffield Corporation of special ventilation arrangements in back-to-back houses in that city. For the district council Dr. Peck asserted that unless the back-to-back type was altered the houses could not be considered fit for habitation. In his last annual report he had shown that during the past five years the death-rate from all causes in the back-to-back houses was considerably more than double that recorded in the rest of the parish in which the houses are situated, and that the infant mortality-rate was equal to 469 per 1,000, compared with 126 per 1,000 in the parish as a whole. These figures are quite in accordance with those found by observers elsewhere. After considering the question for several months the Board has confirmed the closing orders made by the district council. It is, perhaps, too large an assumption that the Board will consider a back-to-back house uninhabitable solely because it is of back-to-back type, but the Chesterfield decision will assist medical officers of health in deciding whether they shall take into consideration the fact of a particular house being of that type when making a representation of the unfitness of a house for habitation.

SPORTS OR NATURE?

"MAKE the boy interested in natural history if you can; it is better than games; they encourage it in some schools. I know you will keep him in the open air." Such were Captain Scott's last instructions to Lady Scott concerning the education of their son. These words will strike many parents and many schoolmasters. The general idea amongst the fathers of boys and their masters is that it is almost, if not quite, as important that youth should excel in cricket and football as that it should receive a suitable mental education. In its true sense education, we all admit, means more than iambics and arithmetic, and the training of the body is more important than the acquisition of the grammatical rules of a dead language. Our public schools and numerous private institutions turn out splendid young fellows and their subsequent young manhood is quite as much the better for sports as for learning. Yet there is another side to the question. Already when *Tom Brown's School Days* appeared, its author, so eminent an authority on the subject, hinted in his introduction that the public schoolboy was growing too much the slave of routine even in sports, and quite recently monthly magazines and books by schoolmasters have brought similar charges against public schools. One main objection is the tyranny of the conventional sports; boys are made to don the flannels, and obliged to "play" their games at stated hours. To many youthful souls the sport in consequence is not "play" at all. It is work rather than recreation. The games, too, go on week after week, term after term, with a regularity which some boys find monotonous. "Latin—cricket—cricket—Latin" was a summary of school life once delivered to us by a member of our profession who had growing boys, and who admitted that Latin was not so overdone as in the days of his youth, but who dreaded lest his boys' view of life might be the supremacy of county cricketers and the hero-worship of a 'varsity stroke. Indeed, fashionable sires have admitted that their view was precisely the same, and from their point of view they are not wrong, for lads *fruges consumere nati* seldom make the least use of any classical and mathematical learning they may have acquired, whilst it is all to their advantage to join in sports in adult life. But most boys have to earn their living, and sports which gave them stamina in their school days will be out of the question when the duties of their calling allow little leisure, and the emptiness of their purses forbid subscriptions to cricket and rowing clubs. Schoolmasters cannot be expected to fail in their duty by encouraging the loafer—the most objectionable type of lad in any school. Yet possibly the pedagogue may develop a system which will not give his pupil the false idea of life often instilled into his heart by routine sports almost as irksome as routine lessons. He may teach him to learn the regularities and the irregularities of nature, without being made a dreamer, nor need he be taught that natural history means the extinction of rare species by birds'-nesting and butterfly hunting.

STATE CHILDREN.

THE annual meeting of the State Children's Association was held at 24, Park Lane on October 28th, the Earl of Lytton in the chair. In giving a summary of the work done since the last report was issued, the chairman said that the term "State children" meant those who by accident, neglect, or the death of their parents were placed either temporarily or permanently in the care of the State, and were therefore to be found in workhouses, barrack and industrial schools, prisons, reformatories, and other institutions of which the atmosphere and conditions were unsuitable to their healthy life. The object of the association, he said, was to provide for these children conditions of life and education approaching as nearly as possible to the normal life of the child in its own home, and therefore its first business was to remove all children from such institutions, and by legislation and through the administrative action of boards of guardians and other bodies to prevent other children from entering them in the future. The figures in the report issued in January last showed that out of 82,000 children who were entirely dependent upon the rates, no fewer than 22,401 were still in workhouses or workhouse infirmaries. In spite of all the efforts of the association these figures have for years remained very much the same. One encouraging circumstance, however, was, Lord Lytton said, the increase in the number of children boarded out with private families; they now numbered 11,000, a higher figure than the association had ever been able to report before. This was due very largely to the boarding-out order for which the association had pressed so strongly, in the belief that the system of boarding out with families was the proper way of dealing with children who had lost their own homes. A provision inserted in the Children's Act now enabled the boarding-out principle to be applied to child offenders, and up to the present this innovation had proved entirely satisfactory. With regard to child offenders, however, there was still much to be done, as the provision of the children's

courts did not by any means meet all the requirements of the case. What was, he thought, really wanted was a procedure that was altogether different from that of the police court, and it was for this reason that the association welcomed the establishment of the little commonwealth which had recently been started in Dorset. Lord Lytton concluded by saying that the association was anxiously awaiting the proper classification of mentally deficient children, in order that provision might be made for keeping them apart from adults and subjecting them to careful training in small numbers. Speeches were afterwards made by Canon Carnegie, Mrs. Nott Bower, and Sir Albert Spicer, M.P. The latter in the course of his speech referred to the draft Institutions Order, and said that one of the greatest tasks in the work of the association had been to induce boards of guardians to take their children out of the workhouse. In the month of August an altered form of the order had been issued by the Local Government Board, with a statement that the President would be willing to receive suggestions; with regard to the regulations concerning children there were two points which called for special attention. The association had asked the President to give consideration to the proposal to allow guardians to keep children in the workhouse until they were 5 years old, and also the proposal to allow another two years from the date of the issue of the order in which to remove boys and girls from workhouse surroundings. It earnestly hoped that children might not have two more years of workhouse life.

THE FRIEDMANN DEMONSTRATION.

OUR special correspondent in Berlin writes that the professional interest in Friedmann's emulsion, which for the last few months had shown evident signs of flagging, has once again become acute, owing to the demonstration recently given in Professor Kraus's clinic in connexion with the International Tuberculosis Conference. This demonstration, although it was poorly attended, is now being actively discussed in medical circles, and regret is expressed that the firm (Haase and Co., Berlin-Weissensee) authorized by Dr. Friedmann to produce and sell his remedy is not yet in a position to manufacture it in bulk, so that only very small quantities are at present available. Professor Schleich, Dr. Friedmann's most devoted adherent, was the moving spirit of the meeting, and showed some cases of surgical tuberculosis successfully treated in Berlin. Among these were: (1) A man who, after removal of one testicle for tuberculosis, developed a similar affection of the other, for which the surgeons advocated castration—three injections saved the patient from this fate; (2) a severe tuberculous infection of the hip-joint, with sinus formation, had cleared up after the injections, and had remained well for four years; (3) a case of tuberculous knee-joint; (4) tuberculous disease of the bones of the foot, which had remained well for two and a half years; (5) tuberculosis of the metacarpal bones; and several other cases. One of the most striking of these was that of an Englishman who for twelve years had suffered from tuberculous disease of the left shoulder-joint, and who had undergone resection of the joint in London five years ago. This patient came to Dr. Friedmann in great pain with complete ankylosis of the joint and a discharging sinus in the centre of the resection scar. Two intramuscular injections and one into the sinus were given; the sinus healed and the disease, as shown by a comparison of radiograms before and after treatment, came to a standstill. Professor Schleich concluded his demonstration with the observation that Friedmann's emulsion marked a great advance in conservative treatment, and that he himself, during a period of a whole year, had only once found it necessary to resort to the knife, and that was for the purpose of opening an abscess. The next demonstrator was Professor Erich Müller, who had brought 18 cases of pulmonary, laryngeal, bone, and glandular tuberculosis as evidence of successful results. He was followed by Dr. Hans Thalheim, who out of a very large clinic had brought 16 cases of pulmonary tuberculosis, and who put forward the following claims for the Friedmann method: (1) The specific toxic symptoms of tuberculosis, such as weakness, headache, dyspepsia, pains in the chest, fever, night sweats, loss of weight, cough, and haemoptysis, are under all circumstances abolished by the injections. (2) The objective pulmonary signs are soon improved, especially the crepitations. (3) The power to work, and the appetite are restored, and a feeling of well-being and an increase in weight are experienced. (4) Previous injections of tuberculin appear to hinder the process of repair by Friedmann's remedy. Dr. Thalheim was of opinion that the sources of repair were the infiltrations following the injections, and that in them the protective substances were generated, and thence they reached the diseased part of the organism. It followed therefore, if this hypothesis was correct, that the process would come to an end on formation of an abscess and eventual evacuation, and it should therefore be the aim of the physician to prevent this at all costs. Dr. Immelmann then showed a series of radiograms designed to prove that the clinical improvements were the result of histological repair, and Professor Kraus, in whose clinic at the Charité the demonstration had been given, made some observations which, on the whole, were distinctly optimistic in tone. He admitted that all the patients treated by injections in his clinic had very soon shown subjective improvement in their symptoms, but he was not yet in a position to vouch for more than marked amelioration of the toxic manifestations. The most important and surprising statement he made was that he had never yet seen anything approaching these effects with tuberculin. The last speaker was Dr. Friedmann himself. He stated that it was with a heavy heart that he had allowed the sale of the emulsion to the profession in Germany to become general, and emphasized more strongly than ever the necessity for observing the indications he had postulated, with special reference to the intervals and dosage of the injections, maintaining, however, that there was no case of tuberculosis in which the injections were contra-indicated. The remedy was absolutely innocuous in itself, as was proved by the fact that not a single one of all the children he had injected prophylactically more than two years ago—children who from their surroundings might reasonably be expected to develop the disease—had come to the slightest harm in that time. He closed with the oft-repeated injunction to adhere to the indications.

THE PROFESSORSHIP OF PHYSIOLOGY AT OXFORD.

THE Waynflete chair of physiology at Oxford was founded under the ordinances made in 1877 by the University Commissioners, and was held by Sir John Burdon-Sanderson from 1882 until he became Regius Professor of Medicine in 1895, when his friend and former pupil and assistant, Francis Gotch, was appointed to succeed him in the chair of physiology. The lamented death of Professor Gotch last July created a vacancy which has now been filled by the election of Dr. Charles Scott Sherrington Holt Professor of Physiology in the University of Liverpool. Professor Sherrington therefore again succeeds Professor Gotch, for he was appointed to the Liverpool chair when Gotch gave it up to accept the corresponding chair in Oxford. It is interesting and perhaps significant to note that each of these distinguished physiologists has been particularly devoted to the study of the physiology of the nervous system. Burdon-Sanderson gave to it the last years of his life; Gotch was occupied with it during the whole of his career as a physiologist; and the same may be said of Professor Sherrington, who has thrown a new light on many of its most difficult places, but has perhaps raised even more problems than he has solved. It is in this way

that the progress of knowledge is achieved, and we may confidently hope that his future researches in his new sphere of work may be as fruitful of answers and questions as those which have added so much lustre to the medical school of Liverpool.

THE ROYAL SOCIETY.

AT the anniversary meeting of the Royal Society to be held on December 1st, Sir Archibald Geikie, who has served as president for the customary period of five years, will vacate that office, and the Council recommends for election in his place Sir William Crookes, O.M., D.Sc. The first discovery of major importance made by Sir William Crookes, who was born in 1832, dates back to 1861, when by the application of the then new method of spectrum analysis he discovered the element thallium in a seleniferous deposit from a sulphuric acid manufactory at Tilkerode in the Hartz mountains. The first indication of its presence was afforded by the occurrence of a single brilliant green line nearly coincident with one of the inconspicuous lines of the spectrum of barium. The green colour suggested to its discoverer the name "thallium" (from θαλλὸς, a budding twig) for the new element. His attention was given from an early stage of his career to the study of radiations, and his name is a household word as the inventor of the Crookes tube. He has received the Royal, Davy, and Copley medals of the Royal Society, and has thrice given the Bakerian lecture. He received the honour of knighthood in 1897, the distinction of the Order of Merit in 1910, and the value and importance of his discoveries have been recognized by many foreign scientific societies. He is the editor and proprietor of the *Chemical News*. Among the medical members of the Council recommended to be elected on December 1st are: Professor W. M. Bayliss, Professor F. Gowland Hopkins, Professor G. Elliot Smith, and Professor J. Lorrain Smith. It is proposed that the Secretaries, Sir John Bradford, K.C.M.G., M.D., D.Sc., and Professor Arthur Schuster, D.Sc., should be re-elected.

FORMATION OF NEW BRANCHES FOR KENT, SURREY, AND SUSSEX.

A SCHEME for the rearrangement of the South-Eastern Branch together with the Surrey Divisions of other Branches as three Branches for Kent, Surrey, and Sussex, coterminous with those counties respectively, having been approved by the Divisions, the Branch, and finally by the Council of the Association, will come into force this day, Saturday, November 15th. Preliminary meetings have been held this week at Maidstone for the county of Kent, at Croydon for the county of Surrey, and at Brighton for the county of Sussex, at which the Branches have been constituted by the election of officers and by the adoption of the organization and ethical rules.

METHODS OF A FRIENDLY SOCIETIES' FEDERATION.

AN advertisement appeared a short time ago in the *Manchester Guardian* offering an appointment as medical officer to a friendly societies' federation. From information supplied it appears that the friendly societies' federation is forming a medical institute to represent all the friendly societies in a town of over 22,000 inhabitants. In the federated societies there were 500 uninsured adults, 670 juveniles, and 3,500 insured persons, and it is stated that these numbers would be greatly increased by the addition of the wives and families of the friendly societies' members. The salary offered was a minimum of £300 a year to commence with, maternity cases to be paid for at a rate to be decided upon, and it was added that the salary would be increased in proportion to the number of insured persons transferred—that is to say, as we understand, transferred from the lists of practitioners on the panel in the same town. A two years' agreement was suggested, after the expiration of which period the appointment would be terminable by six months' notice on either side. The name of the town does not appear to have been disclosed, but it was suggested that a deputation would meet the appointed doctor at a place to be mutually arranged. It was candidly added that the doctor accepting the post would have to expect the opposition of the local doctors, but would receive the hearty support of the friendly societies and the active co-operation and assistance of the medical institutes of the neighbouring towns, and also, it was stated, the support of the general public. The secrecy observed was stated to be due to the opposition of the British Medical Association. The incident shows the methods to which a friendly societies' federation is prepared to resort. We are sanguine enough to hope that the lure will be spread in vain before the eyes of any self-respecting member of the medical profession.

MR. AUSTEN CHAMBERLAIN has received from the Secretary of State for India a contribution of £500 towards the enlargement and endowment of the London School of Tropical Medicine. The fund now amounts to £71,276.

PROFESSOR F. LOEFFLER, who since 1888 has occupied the chair of hygiene in the University of Greifswald, has been appointed Director of the Koch Institute of Infectious Diseases at Berlin in succession to Professor Gaffky.

ON Thursday, November 20th, Dr. H. Bayon, research bacteriologist to the Government of the Union of South Africa, will deliver a lecture illustrated by lantern slides at the Royal Society of Medicine, 1, Wimpole Street, W., at 5 p.m., on the leprosy problem of the British Empire, including the clinical and bacteriological aspects of the disease, and will make remarks on the clinical characters of syphilis among natives.

WHAT HAS THE ASSOCIATION DONE FOR THE PROFESSION?

WE have received from a respected member, vaguely aware that the British Medical Association has rendered incalculable services to the profession, a request for a statement "in a paragraph this week," of what these services have been, in order that those who are now asking, What has the Association done for the profession? may be judiciously answered.

We must respectfully and regretfully, but firmly, decline to make the attempt. In the first place, the thing could not be done in a paragraph, nor in many paragraphs; and in the second place, an account of all that the British Medical Association has done for the medical profession, at home and in the Dominions, would need months of research if it were to be made complete.

We can only jot down a few of the things done for the profession by the Association which immediately occur to the mind when this surprising question is asked.

Medical Acts.

The Association, though then numerically a very small body, played a large part in obtaining the first Medical Act (1858), and, as a larger body, the chief part in obtaining the Medical Act of 1887. These Acts are not perfect, but what should we be without them?—an unorganized mob.

Public Health Acts.

The Association had a large share in the formulation of the public health laws, stimulating and informing public opinion and safeguarding medical interests.

Public Health Service.

The Association was the father of the public health service. It fought long and persistently for the due recognition by the State and by the public of the leading place which the medical profession must occupy in such a service. Its perseverance has been rewarded at almost all points, and the justice of the last of the main principles for which it has contended—security of tenure for medical officers of health—is now generally acknowledged by public opinion, though the Legislature is still laggard in giving universal application to it.

Vaccination.

The Association has steadily maintained its opposition to the whittling away of the protection afforded to the public health by compulsory vaccination, and has never accepted that monstrous abnormality of catch-vote politics—the conscientious objector.

The Military Services.

The good work done by the Association for members of the profession in the military services of the Crown is well recognized by them. We need only instance the fact that it was due to the persistent advocacy of the Association, through ill report and good, that the medical service of the army was constituted a Royal Corps, with proper status and pay, and with adequate authority and facilities for discharging the important and multifarious duties which modern conditions of science and warfare impose on those responsible for safeguarding the health of the fighting man and treating him efficiently when suffering from the injuries and diseases which he must encounter in the service of his country. The organization of the Royal Army Medical Corps was easily and without question extended, when the Territorial Force replaced the Volunteers, to include the civilian practitioners who offered their services to the new citizen force and assured to them at once a proper position in the scheme.

Medical Science.

The Association has defended the right to apply the experimental method so fruitful in other sciences to physiology and pathology, and has itself contributed directly to the advancement of medical science by annually voting a sum amounting to from 15 to 20 per cent. of its net surplus, at the time when its financial affairs were most prosperous, for scientific research, and has maintained the vote in spite of the serious calls upon its financial resources during the last few years. By its scholarships and grants it has given encouragement to a host of inquirers, many of whom are now among the leaders in experimental medicine. It has also encouraged clinical investigation, the record of clinical experience, and the dissemination of clinical and scientific information through its annual meetings—it will meet next year in the university city of Aberdeen under the presidency of the Emeritus Professor of Surgery, Sir Alexander Ogston, and in 1915 in the university city of Cambridge under the presidency of the Regius Professor of Physic, Sir Clifford Allbutt—through the clinical and scientific meetings of its Branches and Divisions—a subject dealt with more at length elsewhere in this issue (p. 1316)—and through its JOURNAL, which brings every week on to every member's table a critical review of every advance in theory and practice made throughout the world. Whether he reads it diligently or not is a matter beyond the Association's control. You may lead a horse to the water but you cannot make him drink. Certain it is that a man who turns away from the stimulus of other men's thoughts and observations, and supinely imagines that his recollections of the students' lecture room, supplemented by his own necessarily limited experience, are sufficient, will presently find himself elbowed out of the way by the eager crowd of younger and more ardent spirits. Some men seem content to stagnate in a backwater out of the stream of progress, and only just the other day one of the gentlemen who want to know what the Association is good for and never read the JOURNAL also wanted to know what salvarsan was good for, and had just heard of ionization because some one had cured a rheumatic joint for him by that therapeutic method.

The Insurance Act.

The introduction of the Insurance Bill in 1911 brought about a crisis in the affairs of the medical profession in Great Britain the like of which it had never before had to face. The Association accepted the principle of State insurance against sickness, but stood forward as the champion of the profession against the imposition of terms and conditions impolitic, unjust, and injurious alike to it and to the public. In spite of many adverse circumstances, both in the political world and within its own borders, the Association succeeded in winning over public opinion, and compelled the attention and gained the sympathies of the majority of members of the House of Commons, with the result that the Government, after vowing it would ne'er consent, consented to so modify the scheme that many of its most objectionable features were eliminated. The modifications obtained by the efforts of the Association with the goodwill of the medical corporations, but without any active support from them, established the principle of the free choice of doctor by patient and of patient by doctor, ousted the control of the friendly societies over medical affairs, and gave to the profession a representation on the administrative bodies instituted by the Act which, though numerically inadequate, has yet been so effectually used to make the medical case known, that the enemies of the profession and its own socialistic wing are now anxiously considering how to diminish the influence thus exerted. The Association also obtained a definition of the services to be rendered in respect of medical benefit by members of the profession who accepted work under the Act; it established the principle that the so-called sanatorium benefit must include domiciliary treatment under a separate estimate; and, finally, to make a long story short, it caused the rate of remuneration to be raised 50 per cent. above the original offer. Any one who has taken the trouble to read the articles upon the struggle now in progress between the amalgamation of medical associations and the amalgamation of insurance (friendly) societies in Germany, will have realized that, thanks to the Association, the profession in this country has started from a position more advantageous than that now sought by and denied to the profession in Germany.

The respect inspired by the political activity of the British Medical Association may, in fact, be estimated by the bitterness of the attacks made upon it by newspapers possessing political and ethical standards, such as those that actuate the *Daily News and Morning Leader* of London.

The Future.

Everybody, we believe, agrees, except those who desire to become salaried members of a State medical service, taking their orders from a knot of bureaucrats in London, Cardiff, Edinburgh, or Dublin, that the positions won in the first campaign of the long controversy before us can only be retained, to say nothing of achieving any advance, if every assault is vigorously repulsed, and every mine promptly uncovered. To these tasks the Association has set itself, and it will accomplish them if, but only if, it has the whole-hearted support of its members. It needs all the men it has and more recruits, and it needs more money. We want more of the courage and the constancy of our fathers, who, though a small band, did not flinch from their duty to the profession and to their successors in it.

Conclusion.

The half has not been told.

DR. FRANCISCO M. FERNANDEZ, a member of the Cuban Chamber of Representatives, has introduced a bill providing a pension of £180 a year for every physician and surgeon of Cuban birth who has attained the age of 60 and is in straitened circumstances. The pension may also be granted to doctors under 60 years of age who are incapacitated from following their profession and gaining their livelihood. The preamble of the bill sets forth the grounds for the proposal as follows: "The doctor is the man whose services are most abused and least rewarded, with few exceptions; and, besides, those who devote themselves to this profession expose their lives at every moment. Besides the risks they run and the serious responsibilities they undertake, it is among them that there is the highest death-rate." Though it may be feared that Dr. Fernandez's bill will never advance beyond the stage of an academic proposition, yet we congratulate him on his endeavour to secure some recognition for the work of men whose treatment by the State and public authorities can scarcely be called generous.

England and Wales.

[*FROM OUR SPECIAL CORRESPONDENTS.*]

LONDON AND MIDDLESEX.

London County Council.

Control of Massage Establishments.

The Public Control Committee reported to the London County Council on November 11th as to the details of the proposals for the control of massage and similar establishments recently adopted.[1] The Committee stated that nursing homes were proposed to be included, but at the same time it was only right to say, with regard to the great majority of nursing homes and many establishments providing other forms of treatment, that there was no suggestion as to their being carried on in any other than a proper manner. It was sometimes alleged that nursing homes were carried on by unqualified persons or with an insufficiently qualified staff. As to this the Committee was not in a position to judge, and it did not consider it to be the duty of the County Council to interfere in such a matter. Consequently this point had not been dealt with in the present proposals. The Committee felt that the principle of registration was the best that could be adopted, the right of appeal to a court of summary jurisdiction being given. Special means must be taken to deal with attempts at evasion by adopting trading descriptions other than those specified by the Council. Furthermore, if the proposed legislation was to be effective severe penalties must be imposed. The premises to be registered were to comprise those used as nursing homes, or for the purposes of massage or manicure, or for administering curative treatment by light, electricity or baths or other similar treatment. All Poor Law institutions and such hospitals and other premises as might be defined by the bill or otherwise were to be exempt from registration. Where the registration authority had reason to believe that the title of a business had been adopted as a cloak to the carrying on of a disorderly house its officers should have a special right of entry, subject to regulations. The penalties provided were £50 and a daily penalty not exceeding £20 for a first offence, and the same maximum penalties with or without a term of imprisonment in respect of a second or subsequent offence. In the case of a company it was provided that proceedings might be taken against all or any of the directors as well as against the company. The Committee also proposed the following clause:

> It shall be an offence for any person or company knowingly to advertise, or print or publish an advertisement of, any owner or occupier who has been struck off the register.

Mr. Salmon moved an amendment to make borough councils the authorities for carrying out the proposed legislation, on the ground that they already exercised powers under the Disorderly Houses Act.

In reply, Mr. P. C. Simmons, Chairman of the Public Control Committee, said there was no similarity between this work and the powers exercised by the borough councils under the Act mentioned. The proposal was one for registration, and this obviously was best carried out by a central authority. The power of inspection was also needed; for lack of this evidence could not be obtained in suspicious cases. It was impossible to persuade Parliament to give the police power to register massage establishments. The work must be carried out in a judicial manner, and evidence must be heard. There must be uniformity throughout London. The only object of these proposals was that the genuine should remain and the evil be rooted out; such a policy had nothing to do with the work under the Disorderly Houses Act. It was admitted that some of the establishments to be dealt with were perfectly legitimate.

The amendment was lost by 43 votes to 19, and the proposals of the Committee were then approved.

Administration of the Mental Deficiency Act, 1913.

The Council debated at considerable length a proposal by the General Purposes Committee that for the purpose of administering the Mental Deficiency Act, 1913, the Asylums Committee be abolished as a statutory committee and that a new committee be appointed to co-ordinate the asylums work and the care of the mentally defective under one administration. Persons having special knowledge and experience of the care of defectives would be co-opted and the Council would have direct control of expenditure, which it had not at present in regard to the Asylums Committee.

Members of the Asylums Committee, without distinction of party, protested against the proposal. They complained that the majority of the members of the Council took little interest in the very trying and arduous work of the asylums; there were at the present time twelve vacancies on the Committee, although the various subcommittees were very hard pressed. They objected to financial control by those who were not acquainted with asylums work, and feared that party spirit, hitherto excluded from asylums administration, would be introduced. The Asylums Committee suggested that a subcommittee of its body should deal with mental defectives.

Mr. Ernest Gray, chairman of the General Purposes Committee, declared that the members of the Asylums Committee were taking a narrow view. This was the first time it had been suggested that the child and the adult mentally defective should be brought under one control. There was no more difficult problem in the whole field of medical science than the determination of the line between the various classes of mental defect, how the strain was carried on from generation to generation, what were the causes and what the results of the operation of certain causes. If one committee had charge of the adult, that committee must also watch the succeeding generation of children. The Council now had an opportunity that every social reformer had been wishing for.

Several amendments aiming at postponement having been rejected, the Council decided, by 69 votes to 48, to proceed with the scheme.

Basis of Medical Treatment Grants.

It was reported to the Education Committee of the Council on November 12th that the Board of Education has decided to make grants for medical inspection as well as treatment, and when satisfied that the provision was adequate and the working efficient to pay a grant at the rate of one-half of the expenditure, and otherwise either to pay at a lower rate or to withhold the grant. The effect of the change is that whereas the grant last year represented only 28 per cent. of the total expenditure, the Board is now prepared to pay at the rate of 50 per cent. The points which the Board will take into consideration in deciding the quality of the school medical work are the inspection of the groups prescribed by the code, the following up and treatment of cases of defect found in the course of medical inspection, the co-ordination of the work with the general public health service, and the organization of school medical work as an integral part of the education system.

Middlesex County Council.

Treatment of Tuberculosis.

It was reported at the last meeting of the Middlesex County Council that a number of applications had been received from non-insured persons suffering from tuberculosis for institutional treatment. Hitherto sanatorium treatment had been limited to insured persons, but the Public Health Committee stated that sufficient progress had now been made for it to be possible to begin the treatment of non-insured persons. Seeing that insured persons contributed towards the cost of sanatorium benefit, it would only be equitable that a contribution towards the cost should be made by non-insured patients, the amount being considered in each case on its merits. The Council passed the following resolutions:

> That where the Council thinks it advisable, the treatment of non-insured persons suffering from tuberculosis be undertaken at hospitals, sanatoriums, and dispensaries by the County Council upon the basis of a contribution being made, where possible, by the patient towards the cost of maintenance or treatment.
>
> That institutional treatment be undertaken only so far as accommodation is available at any of the hospitals or sanatoriums under the control of the County Council, or to which it has agreed to send patients.
>
> That the Public Health Committee be authorized to sanction the above treatment and to settle the amount of the contribution, if any, in each individual case.

[1] British Medical Journal, October 25th, p. 1111.

Ireland.

[*FROM OUR SPECIAL CORRESPONDENTS.*]

The Housing Problem in Dublin.

The general public in Dublin are much surprised at the attitude of the Chief Secretary towards the demand for a Viceregal commission of inquiry into the question of the housing of the working classes in Ireland. When the demand was first made Mr. Birrell suggested that a private inquiry should be held; last week he received deputations on the subject from the Women's National Health Association, the Housing and Town Planning Association, and the Dublin Citizens' Association; all pressed strongly for the appointment of a Viceregal commission as the only means of obtaining trustworthy evidence of the facts, and of fixing the responsibility for the appalling state of affairs which undoubtedly exists, as shown by the information supplied by the Registrar-General. In Dublin in 1911, there were 21,133 one-room tenements, containing a population of 69,000; in Bristol, with a nearly equal population, there were only 3,700 one-room tenements, containing 5,000 persons. In Dublin the percentage of the population living thus is 26 per cent. compared with 1.5 per cent. in Bristol, 5.6 per cent. in Edinburgh, and 13.2 per cent. in Glasgow. It was suggested that the inquiry should apply to the whole of Ireland and not to Dublin alone, but the other Irish towns are in a much better position than Dublin. Limerick has only 7.9 per cent. of its population in one-room tenements, Cork 4.7 per cent., Londonderry 3.1 per cent., and Waterford 2.9 per cent. The death-rate, the infant mortality-rate, and the tuberculosis death-rate are all much higher in Dublin than in the other cities mentioned. Mr. Birrell freely admitted the evil and the need for a remedy, but devoted himself chiefly to giving reasons why he preferred an inquiry by a committee of the Local Government Board to a Viceregal commission. The latter method would, he said, be more costly and would involve greater delay; he admitted, however, the advisability of making the inquiry public. Since then a Committee of the Local Government Board has been appointed to investigate housing conditions in Dublin, and is to start work on November 18th. It is generally considered that this is not a satisfactory compliance with public demands, as the Local Government Board is to some extent responsible for the present conditions in Dublin. Political reasons are suggested for the refusal to satisfy the public demand for a Viceregal commission.

School Clinics.

Last week a meeting was held in the Mansion House, Dublin, under the auspices of the Irishwomen's Reform League, for the purpose of discussing the need of school clinics and medical inspection of school children in Ireland. Dr. Edward Magennis presided, and in introducing the subject said that in Ireland more importance seemed to be attached to the young of animals than to the young of the human being; the country was about a century behind the times in this respect.

Dr. Marion Andrews (Belfast) proposed the first resolution, as follows:

> That this meeting of the Irishwomen's Reform League calls upon the Government to pass into law at the earliest possible date a measure providing for the adequate medical and dental treatment of all children attending Irish primary schools and of infants below school age. That copies of this resolution be sent to the Prime Minister, the Chief Secretary for Ireland, Mr. John Redmond, Sir Edward Carson, Mr. William O'Brien, and Mr. Ramsay Macdonald.

She said that at the present time all over England and Wales the elementary school children were being medically examined and their major defects remedied. The ideal should be healthy children in sanitary schools, and by means of various philanthropic associations much might be done to carry out this ideal, with the hope of some time receiving Government assistance in the work. The National Board had awakened to the fact that bad teeth were at the root of a great deal of ill health, and had allocated a certain sum of money to be spent on dental treatment. The Treasury had agreed to provide £1 for every £1 subscribed by the public. The first offer of this grant was made for the last financial year, and more than four-fifths of the grant went back to the Treasury. Something had been done in Belfast, where a dental clinic had been started in connexion with the Children's Aid Society.

The resolution was adopted, as was also the following:

> That this meeting of the Irishwomen's Reform League calls upon the Government to pass into law as soon as possible a measure adapted to Irish conditions, providing for the feeding of necessitous school children.

Scarlatina in Belfast.

At the meeting of the City Council on November 3rd, the Chairman of the Public Health Committee (Dr. Thomson) drew attention to the prevalence of scarlatina, and said that the incidence of the disease had been steadily increasing during the last three years; 378 cases of infectious diseases had been notified during the last five weeks, as compared with 286 in the previous five weeks, and 235 in the corresponding period of last year. The large majority of these cases were scarlatina. Dr. Thomson said that it was practically impossible to control the spread of the disease when it had developed to a certain extent, and everything had been done that could be done. We appreciate the difficulties of the situation, but doubt whether these words will carry conviction to the educated and restless voters of the present day. The Purdysburn Fever Hospital has had a succession of singularly able resident physicians, many of whom have since been elected to scientific and responsible posts. Why not take a leaf out of the American book, and choose the best three of these young men available; grant them a liberal salary for a year or two years; give, say, £1,000 towards a research fund, and instruct them to present a conjoint report on their work? The problem that is before the public is as follows: A large and commodious fever hospital was built in a magnificent site—if distance from town does not count as a drawback; it is conducted in the most liberal manner, and costs the city many thousands a year. As are all fever hospitals, it is an expensive institution to maintain; and yet scarlatina has been steadily increasing, and people are becoming alarmed. The older methods have failed; let us see what can be done by younger minds, with a modern scientific training, and free to carry out their investigation by modern methods. The expense would be little more than the fifth of one year's upkeep of the hospital itself.

Old Age Pensions and Insurance.

At the last meeting of the Limerick Board of Guardians Dr. McDonnell, resident medical officer, reported that the male hospital was overcrowded. The master said that since the inception of the Insurance Act the number of inmates in the hospital had increased from 15 to 20 per cent. He had no doubt that malingering was going on. One of the guardians said that as a magistrate the people came to him with papers to sign, and he aftewards found that they were malingering. Dr. McDonnell explained that at this time of the year there was always overcrowding in the hospitals. On former occasions he fell back on the fever hospital for accommodation, but at present the fever hospital was full. Judging from the number of certificates issued, he did not think there were so many insured persons in the workhouse as had been suggested; if the overcrowding was due to legislation at all, it was rather to the Old Age Pensions Act. The master disagreed with this view, and it was decided that he should furnish a weekly return showing the number of insured persons in the hospital.

Scotland.

[*FROM OUR SPECIAL CORRESPONDENTS.*]

Proposed Eugenics Education Society in Edinburgh.

At the close of the conjoint meeting of the Medico-Chirurgical and Obstetrical Societies on October 29th, when Major Leonard Darwin gave his address on "The Need for Eugenic Reform," and entered a plea for the formation of a Eugenics Education Society in Edinburgh, a short conversation took place on the subject, and a provisional committee was nominated to consider the

advisability and the feasibility of the suggestion. Sir Thomas Clouston consented to act as convener of the committee, and among the members nominated were Professor Cossar Ewart, Dr. Berry Hart, Dr. J. W. Ballantyne, Dr. Clarkson, Mr. Smith (of Merchiston School), Dr. A. J. Brock, and Mr. Orr (actuary). It is understood that the provisional committee met on November 7th, when various opinions were expressed regarding the proposal to form such a society in Edinburgh, and that it was finally decided that a circular should be drafted to be sent to clergymen, medical men, alienists, educationalists, actuaries, and others who may be interested, in order to gauge the amount of support which the proposed society was likely to receive.

The multiplicity of medical and scientific societies in Edinburgh is felt by some to be an objection to the hasty formation of a new one. The Royal Society, the Medico-Chirurgical, the Obstetrical, the Royal Medical, the Botanical, the Scottish Microscopical, the Odonto-Chirurgical, the Pharmaceutical, and the numerous clubs (for example, the Pathological) have so occupied the days of the week as to leave but small room for another scientific association. Further, attempts at race betterment in Edinburgh have been more particularly directed towards the improvement of the hygiene of the child after birth and of the infant before birth (by caring for the expectant mother), and eugenics as defined by Major Darwin ("the benefiting of posterity through the agency of heredity") do not touch these methods of post-natal and antenatal hygiene. At the same time eugenics is "in the air" at the present time, and several people feel that there should be some organization in Edinburgh which would give an opportunity for full discussion of the problems of heredity as they apply to social conditions, and especially to infant welfare.

Testimonial to a Medical Ex-Provost.

Dr. Stone, who was provost of Montrose during 1909–12, was on November 8th presented with his portrait in oils, painted by Mr. Fiddes Watts, A.R.S.A., in recognition of his services to the community and as a tangible token of the respect and esteem in which he is held in the town and district. The presentation was made by Captain Stansfeld of Dunninald Castle, and was suitably acknowledged by Dr. Stone. The ceremony took place in the Municipal Buildings in the presence of a large company of ladies and gentlemen.

New South Wales.

The Small-Pox Epidemic.

Our special correspondent in Sydney writes under date September 23rd: The epidemic of small-pox still drags on, and each day from five to ten new cases are reported to the Health Department. At the first outbreak of the disease the Federal quarantine authorities quarantined the metropolitan district of Sydney, with the result that business has been hampered and serious loss incurred, specially by the smaller retail houses. Efforts have recently been made to induce the authorities to suspend the quarantine restrictions, and the Board of Health has issued the resolutions passed at its meeting recently as follows:

That the Board of Health has now at its disposal the experience gained by its medical staff in 700 cases of small-pox which have occurred during the present epidemic in Sydney.

The Board is satisfied from such experience that the disease now present in Sydney is an exceedingly modified form of small-pox, mild in its nature, and with no tendency to change its type and become more virulent, and in this view they are supported by the writings of Castellani, Chalmers, and others.

That the danger of it becoming epidemic in the other States of the Commonwealth is negligible, seeing that compulsorily vaccination laws have been in force there for very many years past.

That the Board has by its strong advocacy of the effectiveness of vaccination as a protective measure succeeded in inducing more than one-half of the population of Sydney and suburbs to protect themselves in this manner.

That sea quarantine, which is admittedly the most effective form of quarantine possible, has proved itself ineffective in preventing importation of this type of small-pox to Sydney.

Therefore, land quarantine, which is of very little effective value in dealing with large communities, cannot be considered satisfactory or necessary.

That, in conclusion, the Board is of opinion that the proclamation issued by the Federal Government quarantining Sydney should be withdrawn, as it is unnecessary, and while in existence is injurious in many respects to the State of New South Wales in particular and to the Commonwealth in general.

In the House of Representatives on September 18th the question of the advisability of removing the quarantine embargo on Sydney was discussed, and the following motion was submitted:

That, with a view to putting an end to the suffering, sacrifice of human life, and the commercial, industrial, and domestic stagnation in the State of New South Wales resulting from the proclamation and administration of the laws governing small-pox epidemics, this House is of the opinion that the proclamation should be cancelled, and that isolation, combined with sanitary reform, the true enemy of small-pox, should be substituted for the present injurious methods.

In the course of the debate on this motion a great deal of nonsense was talked, specially by the antivaccinationists, as to the number of deaths which had occurred as a result of vaccination, not to speak of the number of persons who had lost their arms in consequence of the operation! Eventually the debate was adjourned for a fortnight.

Some interesting facts have been made known as to the experience of the health officers of the value of vaccination as a preventive of small-pox in the present epidemic in Sydney. Of 700 cases of the disease which have been sent to quarantine so far, in only two instances had the patients undergone apparently successful vaccination more than twelve days and less than ten years before contracting small-pox. In both cases mentioned the success of the vaccination was considered doubtful by the medical officers of the department who had examined them. In a number of instances persons who had been in contact with individuals previously sent to quarantine suffering from small-pox had developed the disease about fourteen days after the removal of the first patient, although they had been vaccinated. In all these cases, however, the vaccination had either completely failed or had resulted simply in "mulberry reactions." One striking instance of the value of vaccination was furnished by a member of the staff of the Health Department. Every member of the staff, with one exception, had been vaccinated when the outbreak of the disease first occurred. The exception was one of the disinfectors, who neglected to comply with the instructions given to him. He was the only member of the staff who eventually contracted the disease and had to go into quarantine.

The Vaccination Bill.

The Vaccination Bill was submitted to Parliament by the Premier last week. While it apparently makes vaccination compulsory, its provisions in this respect are nullified by a "conscientious objection" clause. Under this bill all children born after October 1st next must be submitted to vaccination within twelve months of birth and again between the age of 10 and 11 years. When the child has passed his or her twentieth year he or she must submit to vaccination before reaching the age of 21. Persons physically unfit to undergo vaccination may obtain an exemption certificate without difficulty. A conscientious objector, however, may get a certificate of exemption by making a declaration on oath before a magistrate. Persons who defy the Act are liable to a fine, but the total penalties in respect to each person or child must not exceed ten pounds. The governor by proclamation may divide the State into districts to facilitate vaccination. On the appearance of small-pox or any disease suspected to be that in any district, the whole or part of that district may be quarantined and subjected to cleansing and disinfection. The Board of Health were to appoint public vaccinators in each district, but the vaccination certificates of private practitioners will be recognized. But an extraordinary provision is introduced here, that no practitioner is to be allowed to use lymph which has not been obtained from the Government. Penalties for any breach of the Act are imposed in the shape of imprisonment for not less than three months or more than twelve, without the option of a fine, or a fine not exceeding £20. This bill is meeting with severe criticism even before it has been seriously debated in Parliament, and at present it does not appear probable that it will be passed, at any rate in its present form.

India.

[*FROM OUR SPECIAL CORRESPONDENTS.*]

Vaccination in Bombay.

The Sanitary Commissioner with the Government of Bombay reports that during 1912–13 the number of primary vaccinations was 710,592 and of revaccinations 70,939, the respective increases as compared with the preceding year being 18,419 and 2,247. Throughout the districts the percentage of successful vaccinations, excluding the "unknown" results, was 97.99. Of the total number of persons primarily vaccinated, 5,894 were Christians, 537,795 Hindus, 123,617 Mohammedans, 1,641 Parsis, and 41,645 persons of other castes. The age details are compiled for three periods—namely, under 1 year, between 1 and 6 years, and above 6 years. The number in each age-period primarily vaccinated was 559,221, 128,799, and 22,572 respectively, while the successful operations for the same age-periods were 514,423, 115,400, and 9,584. The expenditure on vaccination amounted to Rs.376,586, as compared with Rs.353,706 in 1911–12. During the year 775,587 doses of lymph were distributed, as against 673,812 in 1911–12—641,975 to vaccinators of the Presidency, 22,415 to vaccinators in Sind, 31,175 to medical officers, and 80,022 to native States. The total cost of the Vaccine Institute at Belgaum was Rs.36,578, as against Rs.34,508 in 1911–12, the excess being due to an increase in the director's pay and allowances, a greater number of stable attendants, grain compensation, and travelling allowances to the staff. The cost per dose of lymph amounted to 8.71 pies, as against 7.26 pies in 1911–12. Consequently, allowing 4 per cent. interest on the capital cost of buildings, the cost dose works out at 11.22 pies. No instances were reported of any disease having been communicated through vaccination.

The All-India Sanitary Conference.

The services of Captain R. A. Needham, I.M.S., Health Officer, Simla, have been lent for a period of three months to the Government of India Sanitary Department, in connexion with the next All-India Sanitary Conference, to be held at Lucknow next January.

The Milk Supply.

One of the chief difficulties which confront the authorities in framing new regulations with regard to the milk supply is that stringent rules are bound to affect the price. At the recent agricultural conference at Poona, Dr. Mann showed that the Kirkee Military Farm can place unadulterated first-quality milk in Bombay at a moderate price. The ultimate solution will probably be found in the removal of the milch cattle stables from congested and populous parts of the city. Everything should be done to encourage the growth of country dairies and to discourage the keeping of cattle for commercial milk production in the city. There is a project already on foot for the establishment of an up-to-date dairy in Salsette for the supply of good and pure milk.

The Health of Bombay.

A grim record of the ravages of disease in the Bombay Presidency during 1912, which was a singularly black year so far as the public health was concerned, is contained in the annual report on the working of the sanitary department. Plague and cholera were the two baneful factors which accounted for the heavy death roll, which was not less than 125,000 in excess of the previous year's record, the total mortality from all causes showing a death-rate of 34.88 per mille, as against 28.35 in 1911 and a decennial mean of 32.00. How much the material happiness of India depends on a good monsoon is shown by the fact that the chief explanation of this high rate of mortality is to be found in the irregular and spasmodic rainfall, which set up climatic conditions peculiarly favourable to the spread of epidemic disease and to the prevalence of sickness amongst infants and children. Cholera, which was peculiarly rife in Bombay City, was widely prevalent during the year, and the deaths from this dreaded malady alone numbered 64,505, a figure which has hardly been approached since the famine year of 1900. Mention is made in the report of the encouraging results obtained in the treatment of cholera by the internal administration of potassium permanganate, and, though the limited scope of the experiments so far undertaken does not admit of any definite conclusions being formed, every facility will be accorded in future for an extended trial of this mode of treatment. A leading Bombay newspaper cordially endorses the opinion expressed in the Government resolution of the Sanitary Commissioner's report, that no opportunity should be lost of testing the value of any remedy that is likely to be of use in dealing with a scourge which is annually responsible, in the Bombay Presidency alone, for the loss of a quarter of a lakh of human beings.

The Lord Hardinge Hospital at Dharampur.

The Lord Hardinge Hospital at Dharampur in the Simla Hills was opened by His Excellency the Viceroy a few days ago. In the course of his speech he said that he hoped the hospital had before it a long and useful career, and that within its walls health might be restored to the sick and hope to the hopeless.

Hong Kong.

In the annual report for the year 1912 of Dr. Francis Clark, Medical Officer of Health for Hong Kong, the outstanding feature is a careful description of an outbreak of plague of unusual severity. It is attributed by him largely to the overcrowding brought about by between forty and fifty thousand Chinese choosing the colony as a refuge during the political disturbances in China. It is noted that in the experience of the colony the drain rat, or *Mus decumanus*, remains infected with plague practically throughout the year, while infected house rats are only found during times of unusual prevalence of the disease among human beings. The way in which many of the older houses of the colony are built—namely, with hollow walls constructed of soft bricks—makes them ideal homes for the *Mus rattus*, or house rat. Short of such heroic measures as the total destruction of all these houses there is no remedy. A few cases of primary pneumonic plague occurred, but there was no plague among the European community, although sixteen Chinese clerks residing in offices in the European quarter succumbed to the disease.

It is estimated that the population was 467,777, the vast majority being Chinese. In this community the death-rate was 26.33 per 1,000, while among the non-Chinese it was 14.51 per 1,000, the general death-rate being 25.67. Comparatively few of the births among the Chinese population are registered, and reasons are put forward for believing that two-thirds of the children born die in infancy. Among the Chinese community the deaths from phthisis amounted to 8.1 per cent. of the total deaths, as against 10.0 in 1911 and 10.3 in 1910. Efforts to stop a habit, inveterate among the lower class Chinese, of spitting in public places are being made by the distribution of leaflets, lectures, and other means aiming at spreading knowledge of the danger of the habit, and it is hoped that, coupled with improvements in the sanitary conditions of native dwellings, the net result will be to reduce gradually the death-rate from phthisis, despite the fact that in many of the most densely populated districts the soil is waterlogged during the greater part of the year. At present the phthisis mortality-rate of the colony as a whole is nearly double that of England and Wales. During the year special attention was paid to antimalarial measures, which have been carried on more or less actively for over twelve years. They now include attempts at destruction of larvae and abolition of places favourable to mosquito life, the proper channelling of streams, the administration of quinine to school children in certain districts, and the free distribution of a pamphlet entitled *Advice concerning Mosquitos and Malaria*. The subject of hygiene is part of the curriculum of all schools in the colony. Despite these facts, the tables in the report reveal an increase rather than the reverse in the gross mortality from malaria between the years 1903 and 1912. No doubt, however, the population has greatly increased, and in certain selected classes, such as European troops

and the police force, there was a considerable drop in the number of admissions to hospital from malaria in the year 1912. There was also a marked fall in the number of deaths from beri-beri, this being possibly due to the steps that have been taken in regard to it during the past few years. These have consisted in the distribution of circulars to all large employers of coolie labour calling their attention to the fact that beri-beri is produced by the consumption of white rice as the staple article of diet with an insufficiency of other food, and advising that beans should be supplied with the rice when fresh meat or fresh fish cannot be provided. The report affords internal evidence of the difficulties with which the sanitary authorities of the colony have to contend, and to the amount of energy and thoughtfulness with which the task is performed.

Correspondence.

WHOLE-TIME PROFESSORSHIPS.

SIR,—May I suggest a plan which will, I think, as far as English medical schools are concerned, allay "W. O.'s" fears that the appointment of whole-time professors of medicine may do harm in certain directions?

Suppose a general hospital with a medical school has 230 medical beds. If such a school desired a full-time professor, could get him properly paid and could find a suitable man, an easy arrangement would be to have four physicians, three would have fifty beds each, would go round their wards as now with their house-physicians and clerks doing clinical teaching and from time to time giving clinical lectures or demonstrations. They would have nothing else to do except the usual committee work which is part of the running of a medical school; they would be relieved of systematic lectures; they might or might not be paid some honorarium and a part of the student's fees as now, but they would be allowed to do private practice.

The other physician would be the full-time professor, not allowed any private practice. He would have charge of the remaining beds—80, or more if the total medical beds was over 230. His position in his wards would be precisely that of his colleagues in theirs, except that he would probably visit them oftener as he would have more beds. He would have house-physicians and clinical clerks, would teach at the bedside, and would give clinical lectures or demonstrations in rotation with his colleagues. In addition, he would give the systematic lectures, and unless his beds were very numerous he might see out-patients one day a week. Either he or his assistants would hold classes for teaching clinical clerks the elementary work of a clinical laboratory. He would be expected to devote the rest of his time to investigations either in the wards or the clinical laboratory, of which he would be the head, and in which there would be assistants under him. This would be a large and well-equipped laboratory. Further, he would superintend all medical research carried on in the wards or laboratory by senior and post-graduate students.

Such a professor would certainly not be cut off from affiliation with the profession; he would be constantly meeting his colleagues at the hospital, he would meet other physicians at the medical societies, his colleagues being interested in medicine would frequently visit his laboratory to see the latest in laboratory work. There is no fear that the students would become clinicians whose horizon is bounded by the laboratory, for every clinical clerk would, if his period of office were, say, six months, do three with each of two of the four physicians so none could clerk to the professor alone. Then, as now, the best clinical teachers would draw the largest bedside classes and the more able students with them on their rounds; this would breed a healthy competition between the professor and his three colleagues.

I know many say—Have a professor, but let him do some practice, then you would not have to pay him so much as if he did none. I feel sure this is a mistake; if once any private practice is allowed it will be impossible to limit it should the professor be popular, and if he does it his professorial work will either be thrust upon assistants or not done properly. He cannot be allowed only a little practice, for directly he practises his expenses amount, for example, house rent, rates, motor car, etc. Further, permitting him private practice will be unfair to his colleagues, who will not have the high sounding title of professor.

Lastly, while there are many hospital physicians and teachers to whom private practice is congenial, who like it and are made better physicians by it, there are also able men to whom it is uncongenial, and who would if the opportunity offered like to earn their living by work in the hospital. The first class will probably always be much the larger, but I think that the appointment on the lines indicated of a few full-time professors from among the second would be of great advantage to the students, to those wanting to investigate, and to the prestige of English medicine.—I am, etc.,

November 10th. W. H. W.

THE CRAZE FOR APPENDICECTOMY.

SIR,—Everyone must have noticed the present craze for removing the appendix. I do not, of course, refer to operations for acute appendicitis, or to "interval" operations on patients who have had definite acute attacks, but to the indiscriminate removal of the appendix for all sorts of abdominal aches and pains, or even for mere chronic ill health. I think it is high time that we took stock of the position, and asked ourselves whether these incessant appendicectomies are justified by their results.

One can distinguish, I think, three sorts of cases in which the removal of the appendix is constantly being advised or performed with doubtful justification. There are, first, cases of so-called "appendix dyspepsia"; secondly, cases of chronic pain or discomfort in the right iliac fossa; and thirdly, cases of vague ill health, in which the patient (to use the clinical slang of the moment) "looks toxic," and in which it is supposed, on more or less speculative grounds, that an unhealthy appendix may be the source of the "toxaemia."

Now as regards the first of these groups I suppose no one will deny that cases of chronic dyspepsia do exist in which the symptoms disappear after appendicectomy. I venture to say, however, that, *pace* some surgeons, it is extremely difficult to tell beforehand the cases in which this will happen, and one constantly sees patients who have undergone this operation on account of dyspeptic symptoms, but without any real relief.

The results of removing the appendix for chronic pain or discomfort in the right iliac fossa are, I should say, even less satisfactory. Every physician (naturally they do not return to the surgeon) must see large numbers of patients who still complain of their old pains in the "appendix region," in spite of the fact that their appendices are now reposing in bottles, or wherever else the surgeon deposits the trophies of his skill. I believe that in a large number of these cases the pain or discomfort was not due to an unhealthy state of the appendix solely, or even at all, but to a local catarrh of the colon or to muco-membranous colitis. It is true that in such cases the appendix may be found "unhealthy" (how often, by the way, does a surgeon admit that an appendix *is* perfectly healthy?), but it does not follow on that account that it was the cause of the symptoms.

The removal of the appendix merely because a patient is in a condition of vague ill health is a still more speculative proceeding. It is at best a mere gambler's throw, Sometimes it succeeds, although it must be remembered that every such operation entails of necessity a more or less prolonged rest, to which a large part of the subsequent benefit may really be due, but quite often, as any one of any clinical experience will admit, it fails. Sometimes, indeed, it leaves the patient worse than before.

The fact seems to be that some "chronic appendices" are as harmless as an extinct volcano, whilst others may be as potentially dangerous as a powder magazine, and the difficulty is to tell, without exploration, the one kind from the other. It may perhaps even prove that this is impossible, but I cannot doubt that by pooling our experience we would get nearer some working hypothesis than we seem to be at present. What is wanted is that surgeons should publish the end results of these operations in the same convincing way as they have published the results of their operations for gastric or duodenal ulcer. We want also the testimony of the family doctor into whose hands the patients pass after the surgeon has done with them.

With information from these sources we would know better in which cases to advise appendicectomy with some reasonable certainty of benefit, and would avoid those indiscriminate operations which are rapidly becoming a reproach to our profession.—I am, etc.,

London, W., Nov. 7th. ROBERT HUTCHISON.

EXERCISE IN FIBROSITIS.

SIR,—I can endorse the views of your correspondents in regard to the value of exercise (of course within judicious limits) in the treatment of subacute and chronic fibrositis.

In this short communication I should like to emphasize the efficacy of resistance exercise for the purpose of stretching the fibrous tissue involved. I think we are apt rather to overlook the inherent quality of the fibrous tissue to contract after the proliferation resulting from fibrositis, and to palliate the pain or aching by rest and a soothing line of treatment, when gentle tension or stretching of the fibrous tissue would speedily cure the ailment by liberating, presumably, the pressure of the contracted tissue on sensitive nerve ramifications, just as we relieve or cure an obstinate sciatica by stretching the nerve. When in practice at Harrogate I not infrequently obtained the best results in various forms of fibrositis by maintaining a guarded and gradually increased tension on the fibrous tissue for some minutes at a time, and repeating the sustained tension several times after resting intervals. Of course this procedure induced some slight temporary aggravation of the local discomfort; but this is generally followed by relief and often by ultimate cure. Sometimes a patient can himself efficiently practise tension by executing the necessary movements; and when he can do so the relief is often more gratifying than that afforded by the stretching of a manipulator, for he can resort to it more frequently. The efficacy of tension is increased when the movements are performed in a hot bath.

The stiffness of the elderly and many of their fibrositic aches and pains are sometimes quite quickly cleared up by autotension, which is the basis of all the exercise cures. Unfortunately the elderly are apt to allow their fibrous tissue to take on unchecked its senescent tendency to shrink; whereas the evils resulting therefrom may be considerably postponed by judicious training in resistance exercises. For this purpose any one can devise various forms of autotensive exercises which can be followed up in the unoccupied minutes of the day's work. I can also recommend from personal experience the systematic use of Holsworthy's well constructed resistance exerciser, to be obtained from the inventor, 224, Watling Street, Church Stretton, Salop,—I am, etc.,

Farnham, Nov. 10th. GEORGE OLIVER.

THE ROYAL COMMISSION ON VENEREAL DISEASES.

SIR,—In your last issue, under the above heading, my old friend and teacher, Dr. Farquharson, makes use of the words, "Salvarsan, whose uncertainties and dangers have been so effectively exposed by Ernest Lane," from which it might be inferred that I am antagonistic to the treatment of syphilis by that remedy. Had Dr. Farquharson read a communication of mine to the annual meeting of the British Medical Association in 1911 (BRITISH MEDICAL JOURNAL, September 23rd, 1911), and another to the Royal Society of Medicine last year, he would realize that I am a staunch advocate of that treatment, in proof of which I may state that in my wards at the Lock Hospital injections of salvarsan are now being administered at the rate of about one thousand a year.—I am, etc.,

London, W., Nov. 9th. J. ERNEST LANE, F.R.C.S.

SIR,—The publication of Dr. Farquharson's letter on the above subject in your issue of November 8th leads me to add a few further remarks which I hope will meet with your approval. Like my old friend and colleague, I was much surprised when I read the announcement of the formation of this Royal Commission, and my first thought was, What more can be done in this well thrashed-out and loathsome subject? Surely the medical profession is giving it the most careful study, and is best qualified to decide upon the most useful measures to be adopted both as regards treatment and sanitation. It cannot be imagined that a Commission with any idea of decency or common sense could advocate notification, although it might appear at first sight to be the only available recommendation as a result of the inquiry, and it is more than probable that faddists, if there be such on the Commission, would support such procedure. The strongest evidence could be brought against it, and whilst on this subject, I think I might as well report the following interesting case. Many years ago I arranged to vaccinate the baby of a young and very respectable married couple on a certain day, but mercifully for me, and indeed for the cause of vaccination also, I had to postpone doing so until the following week, and I then found it covered with an undoubtedly secondary rash. I think I was justified in not telling either of the parents, and for their mutual happiness I hope they never knew it.

The Contagious Diseases Act did a good work in proving that in our garrison towns (London excepted) it produced a marked diminution of cases, and of this I had very clear personal evidence at Windsor; but surely no stronger evidence could be adduced of its benefit than that it met with the approval of many of the local clergy, for it was believed that it had an excellent moral effect on young girls in saving them from entering on a downward course. But sentiment and political capital stepped in successfully to have the Act rescinded, and though I was strongly in favour of it, I realized that it had many drawbacks, and fully appreciated the sentimental objections which, when brought under public notice, were bound to win the day. This Act, however, will not be taken into consideration, and then I would ask, What is left for this Commission to do? I cannot agree with Dr. Farquharson in his applying the term "sentimental" to women on this Commission, for they must be very strong-minded indeed to allow themselves to serve on it when a subject most distasteful to people of nice mind must be discussed, nor do I believe they quite realize to what they will be subjected.

As to the severity and prevalence of the disease in the present day I cannot believe that any cases can be seen so horrible as those often admitted into the Female Lock Hospital when I was a resident officer there in 1858-9, and the increase of temperance amongst civilians and soldiers since that time must have tended to diminish its prevalence. When one looks back over the last fifty years what a comfort it is to see the great change that has come in our London streets by the almost entire absence of the wretched women who, after nightfall, used to haunt the precints of the barracks and public-houses. Prostitution, clandestine and public, is one of the sad but inevitable conditions of large cities, and with regard to the disease in question the second commandment appears to be especially applicable.—I am, etc.,

ARTHUR B. R. MYERS,
Brigade-Surgeon Lt.-Colonel (late Brigade of Guards).

London, S.W., Nov. 10th.

SIR,—In the Right Hon. Dr. Farquharson's letter to you on the above subject the following sentence appears: "But I may warn the Committee that any attempt to impose notification, with its attendant isolation, will be strenuously resisted."

In my opinion, a statement of this kind should not be made at this stage, when the Commission is occupied with the general considerations of the subject. As a Privy Councillor, one might have expected that Dr. Farquharson would have hesitated before publishing what has the semblance of being of an intimidatory nature. Does he expect the Commission to regulate its deliberations in accordance with his views, and, if so, is respect to be paid to his utterances, whilst those of others are neglected or abandoned? If it is insisted upon by others that notification is the most powerful administrative instrument for the control and prevention of venereal diseases, and that any alternative provision recommended by the Commission will be strenuously resisted, is the Commission to act upon this gratuitous dictation and imperil its decision by not finding in accordance with Dr. Farquharson's warning? It would be more helpful if those interested in the question were to furnish the Commission with their reasoned opinions and logical deductions than to publish dogmatic assertions without any elaboration.

Personally, I am convinced that notification is the most powerful administrative remedy the Commission could

devise. It need not be attended by isolation. No doubt isolation, as ordered by the Scotch Privy Councillors in 1497, would, if generally adopted, eradicate the disease, but national prejudices and economical considerations render such extreme action impossible.

Notification would enable every patient treated for venereal disease to receive a document from the medical officer of health setting forth the dangers of the disease to the patient, the risks of conveying it to others, and the fact that any one found so doing would be prosecuted for committing a criminal offence. There would be no real publicity in this procedure. Publicity would only exist in those cases in which it was possible to trace the infection to its source and the culprit was prosecuted for his criminal offence. Ignorance could not be pleaded in these circumstances, and any exposure to which the individual might be subjected would not deserve our sympathy; certainly we should not permit our sympathy to blind us to the fact that the individual wilfully and with full knowledge of the consequences of his misconduct diseased another person; voluntarily risking prosecution. Rather should we appreciate the retarding power which fear of prosecution and exposure would possess in preventing the spread of these destructive diseases.

Notification of venereal diseases exists in other countries. In Norway it had, I believe, the best results. In this country the Insurance Act provides that patients suffering from sickness consequent upon their own misconduct are not entitled to sickness benefit. An approved society will not pay sickness benefit on a certificate notifying that the insured person is suffering from venereal disease. There are several instances of certificates of this kind being written by medical officers. Here we have what may be accepted as a precedent for an infinitely better, more justifiable, and essential notification—namely, that of venereal disease.—I am, etc.,

SEYMOUR STRITCH,
Member of the Board of Governors, Westmoreland Lock Hospital, and formerly Resident Medical Officer.

Dublin, Nov. 10th.

SIR,—Your correspondent, Dr. Farquharson, is to be congratulated on having the courage of his convictions. It is certainly curious that there are no members of the public services on the Commission on Venereal Diseases, especially as the names of one or two such suitable men so readily occur to the mind. But I believe that otherwise, as to the personnel of the Commission, he is unduly pessimistic. As has been frequently pointed out, the racial degeneration caused by these diseases is due not only to the fact that a large number who voluntarily run the risk of contracting them suffer, but to the fact that their action involves the infection of numerous innocent women and children. Now this being the case, it would seem that the old Contagious Diseases Acts erred, not on the side of practical wisdom but of sentimentality. They controlled, it is true, a few women mostly of the unfortunate class, but had so much regard for the rights and privileges of the ordinary citizen that they let the married purveyor of disease severely alone. As it happens, I have the pleasure of the acquaintance of the three ladies on the Commission, and I also know one of the clerics, and I may say that from what I know of their views this regard of immorality as being proper and natural to man, and this sentimental desire that licence dangerous to the race should parade unquestioned and undealt with under the vaunted name of liberty, forms no part of their mental equipment.—I am, etc.,

H. B. HANSON.

London, N.W., Nov. 8th.

*** The Royal Commission on Venereal Diseases held its first meeting on November 7th, when it was decided that the future meetings of the Commission should be held in private, and that a summary of the evidence given at the meetings should be issued to the press weekly.

THE IDEAL TUBERCULIN.

SIR,—The leading article in your issue of November 8th draws just attention to our ignorance of the mode of action of tuberculin on the healthy and on the tuberculous organism. From its birth this child of genius would appear to have been little understood. Koch himself gave it to the world with a belief in its action so totally erroneous that it led to the disasters of the early tuberculin era. At the present time the mechanism of the immunizing response is explained away by different authorities on the simple plan of hypothecating some substance in the blood which may or may not exist. The real enemies of tuberculin are its devoted and inspired disciples, who write and speak as if our present knowledge of this agent has passed into the permanent practice of medicine. So far from the last word having been said, our knowledge of tuberculin is at its beginning, and if that knowledge is to be extended it must be by careful observation and by clinical experiment.

The design of tuberculin treatment is to induce an immunity in the patient to tuberculin which should approximate to an immunity to tuberculosis. The ideal tuberculin is that which will most easily attain this end. It must approximate in its chemical composition to the infecting bacillus and yet be not identical with it, otherwise the organism which had failed to resist the one could not reasonably be expected to give an immunizing response to the other. Again, the tuberculin should not be widely different from the living tubercle bacillus which is infecting the patient; thus if the tubercle bacillus produces an exotoxin and an endotoxin, and if a patient be treated with a tuberculin containing exotoxins alone, his immunity to the endotoxins will not be affected. On the clinical side it is certain that all who have had any experience of different tuberculins report excellent results in some cases and indifferent results in others. This discrepancy may be due, in those patients who do not do well under treatment, to the tuberculin employed not sufficiently approximating in its chemical constitution to the tubercle bacillus in the patient's body.

An attenuated living culture of the infecting bacillus, or an autogenous tuberculin for every patient might represent the ideal, but would be difficult of attainment. On the other hand, it occurred to me in 1911 that, if the above hypothesis were correct, a tuberculin containing as many different varieties of the tuberculous toxin as was practicable might yield more uniform results. Since that date I have been using a polyvalent tuberculin the composition of which was given at the National Conference on Tuberculosis in August last. The results since 1911 at the St. Marylebone Tuberculosis Dispensary in selected cases of pulmonary tuberculosis are such as would lead one to ask for a more extended trial of polyvalent tuberculin. The formula is:

Tuberculin, Koch	0.025 c.cm.
Bovine tuberculin	0.025 ,,
Vacuum tuberculin	0.025 ,,
Bovine vacuum tuberculin	0.025 ,,
Tuberculin T.R.	0.05 ,,
Bovine T.R.	0.05 ,,
Bacillary emulsion	0.033 ,,
Bovine bacillary emulsion	0.033 ,,
Polygenous bacillary emulsion	0.034 ,,
T.O.A.	0.35 ,,
P.T.O.	0.35 ,,

In each c.cm. of pure polyvalent tuberculin.

—I am, etc.,

HALLIDAY SUTHERLAND.

London, W., Nov. 6th.

VOICE AND SPEECH TRAINING.

SIR,—I understand that, owing to pressure of work, Professor Keith is unable to comply with my request to open up the question of normal healthy breathing in relation to speech which has formed the subject of the report of the University of London Voice Training Conference Subcommittee No. I (BRITISH MEDICAL JOURNAL, August 30th, 1913). In the belief that a satisfactory solution of the whole problem might have been reached, I can only regret that Dr. Keith has not afforded an opportunity of full discussion.

At the present time so much attention is being devoted to improving our national physique that, for efficient instruction to be imparted to the young, teachers must themselves possess accurate and efficient knowledge of right methods both of breathing and singing as well as of physical exercises.

I have no hesitation in saying that, up to now, in this country the whole subject of voice training is in a state

of chaos, all kinds of contradictory and misleading views being promulgated, and I submit that the report, which I wish as briefly as possible to comment upon, is not likely to lessen the existing confusion.

First let us turn to the concluding paragraph (p. 558), which I quote:

> In the breathing of repose the tonus of the broad muscles of the abdomen is such as just to admit of the necessary bulging forward, which is determined by the downward displacement of the abdominal contents by the contracting diaphragm. In breathing for voice this tonus is increased. . . . The effect of this hardening of the abdominal wall checks the outward bulging (which is no longer necessary), and by steadying the lower part of the chest takes a share in the control of expiration.

Now what exactly does this mean? If the diaphragm be "contracting," such contraction must indicate an inspiratory phase. Next we are told that "hardening of the abdominal wall checks the outward bulging," which, if it "is no longer necessary," presumably should not take place. "Hardening" *can* only result from contraction of the musculature of which the abdominal wall is composed, whilst further we learn that the contracting diaphragm in its descent is checked by a contracting abdominal wall. Truly, as Paley would have said, "a contest of opposite improbabilities!"

Turning now to the footnote by Professor Sherrington on "Reciprocal Innervation" we read that:

> The inspiratory and expiratory muscles are mutually antagonistic. There is reason to believe that, like other antagonistic groups, they obey in their relations the rule of reciprocal innervation, that is, when the motor centres of the inspiratory muscles are discharged (*activated*), those of the expiratory are *inhibited*; and conversely. (The italics are mine.)

The portion of the concluding paragraph quoted above is thus a contradiction in direct terms of Professor Sherrington's explanatory note. Several years ago Professor Sherrington instituted a series of brilliant researches on the reciprocal innervation of antagonistic limb muscles. I carefully followed this work in the hope that some day he would direct his attention to the muscles of the trunk, and particularly to those concerned in respiration. Up to now, however, I am unaware of any published work of his dealing with the interaction of diaphragm and abdominal muscles.

As long ago as 1906, as the result of numerous observations and experiments, I was led to the conclusion that the respiratory neuro-muscular mechanisms must inevitably follow the general law of reciprocal innervation, and in a Cambridge M.D. thesis presented during the year 1907–8, amplified later into a monograph on The Diaphragm in Man (*St. Bartholomew's Hospital Reports*, vol. xliv, January, 1909) I published the following.

> Page 161: The diaphragm . . . enters into direct associate action with certain of the thoracic and spinal muscles: in expiration it is antagonized by the muscles of the abdomen; in deglutition it aids the buccal, pharyngeal, and oesophageal muscles, and in phonation the laryngeal. These muscular actions are co-ordinated by means of neurons of association, whereby the nerves of the diaphragm are caused to enter into definite nerve systems or combinations in order to effect the required movements. So, too (page 210) in certain of the mammalia, for example, the rabbit, whose respiration is allied to that of man, there is active contraction of the abdominal muscles. Without movement of the abdomen an animal cannot breathe properly. In other words, just as we see in other parts of the body direct interaction between opposing groups of muscles, the one group being unable to contract without corresponding lessening of resistance on the part of its opponents, so in expiration the abdominal muscles are the direct antagonists of the diaphragm. The diaphragm can only contract by overcoming the resistance of the abdominal muscles; when the abdominal muscles contract, the diaphragm is temporarily inhibited. . . . Similar antagonism takes place between the inspiratory and expiratory sets of thoracic muscles.

In the view of the committee the tonus of the abdominal muscles "in breathing for voice is increased," and by steadying the lower chest they "share in the control of expiration." This again cannot be reconciled with Professor Sherrington's note that "when the motor centres of the inspiratory muscles are activated those of the expiratory are inhibited, and conversely."

We have now to search for the origin of the extraordinary statement concerning the abdominal "check" to the contracting diaphragm. The first indications may be found in a statement by Professor Keith (British Medical Journal, August 29th, 1908, page 591):

> At the commencement of the act of inspiration the muscles of the belly wall are felt to harden and regulate the descent of the viscera, thus antagonizing the diaphragm; their tension is felt to increase as they again push up the viscera, replacing and antagonizing the diaphragm.

In other words, diaphragm and abdominal muscles each pushing against the other during the whole of the respiratory act.

In various editions of his book on *Voice Training in Speech and Song*, Mr. H. H. Hulbert has published various views on this same point. They run like this:

1. 1903 Edn., page 26, under "Breathing for Voice Production," we find "By drawing in the front wall of the abdomen, the organs are fixed in the arch of the diaphragm; this is the first step to be taken." [Any reader who will try to breathe in accordance with these directions will find that the "first step" is also the last, since breathing (except extremely shallow upper thoracic) under such conditions is a physical impossibility.]
2. 1908 Edn., page 24, "Breathing for Voice": "During inspiration the front abdominal wall should be kept quite still, that is to say, the abdominal muscles should not be actually contracted or relaxed, but in a condition of tonicity."

   Also page 22. "If the protrusion of the front abdominal wall is prevented while the diaphragm flattens (!), the ribs are raised and are carried outwards, and both the lower part of the chest and the upper part of the abdomen are increased in size from side to side and from before and backwards."
3. The third and latest change of opinion, for which Mr. Hulbert as one of the signatories must be held responsible, is expressed in the concluding paragraph of the report. Here we discover that the abdominal wall *hardens* in order to check outward bulging (which is no longer necessary).

As a matter of fact, none of these three views are correct. Expansion of the thorax vertically—that is, from base to apex—is of the most vital importance in expanding: (*a*) indirectly, the apex of the lung, and (*b*) directly, in causing descent of its root, together with a main movement of the lower lobe in a downward and forward direction. "Ideal breathing" can never happen if, instead of expanding the chest in its three diameters, it is expanded in two or less by cutting out the most important factor—namely, complete diaphragmatic descent. The combined contraction of diaphragm and abdominal muscles advocated in the report, whilst excellent for purposes of parturition or defaecation, can under no circumstances be recommended for the production of efficient vocal tone.

The report goes on to say: "In health, respiration, properly carried out, brings the whole lung into activity, and in ordinary quiet breathing this process is (largely) automatic." I would say to this that with ordinary quiet breathing only a small proportion of the total lung capacity is brought into play, and the whole lung cannot be brought into activity without adequate diaphragmatic descent. Finally, as I have said elsewhere:

> In order to breathe correctly the entire mechanism of respiration must be used, and not a part only. Medical men, therefore, should, when advising their patients, look to it that the three diameters of the chest are expanded fully, inasmuch as many people imagine that they are taking a complete breath when they are only partially expanding the chest.

There are other points in this report to which I might refer, were it not that I fear to make my remarks too long. I feel strongly, however, that it is a matter of national concern that the rising generation should be taught right methods of breathing. If this were done diseases due to defective aëration of the lungs could undoubtedly be minimized, and so a further step would be taken towards early prevention of our national scourge consumption.—I am, etc.,

London, S.W., Oct. 20th. J. F. Halls Dally.

EXPERIMENTAL OBSERVATIONS ON THE CAUSE OF DEATH IN ACUTE INTESTINAL OBSTRUCTION.

Sir,—Mr. D. P. D. Wilkie's paper on the above subject which appeared in the Journal of October 25th must have interested all surgeons who are frequently called upon to treat these emergencies; but whilst I pay a willing tribute to the ingenuity of his experiments, I cannot allow the conclusions he draws therefrom and some of his statements to go unchallenged. When the result of laboratory experiments is at variance with clinical experience, I have always found it the safer rule to trust to the latter only; the former come into line in time.

I should hardly have thought that any present-day surgeon of experience thinks it necessary at operations for acute intestinal obstruction to "take measures, in addition to relieving the obstruction, to remove the toxic content which fills the afferent bowel and to prevent it from flooding the empty efferent bowel, by which it is greedily absorbed." If surgical interference is made in time, this can be entirely neglected, whilst if not in time, this elaborate toilet will not save him, but rather subtract from his few remaining chances.

The experiment of the high and low intestinal obstruction is occasionally to be observed clinically. A gall stone ulcerates through into the first part of the duodenum; it obstructs the lumen near the proximal side of the duodenojejunal flexure. Acute symptoms follow, even to the occurrence of copious faecal or black vomit. The symptoms suddenly cease, and a few days later the same symptoms, only less urgent, manifest themselves. An abdominal exploration reveals the gall stone now in the lower ileum; it is removed; the patient's recovery is immediate and permanent. The intestine may with safety and with certainty be left to deal with the "highly toxic contents" in its own way and at its own time. I have never seen, I confess I had never even heard of, the loop of a strangulated hernia or its afferent bowel being washed out or otherwise cleared to prevent the absorption of its contents by the efferent bowel. What conclusion is forced upon us by this great mass of clinical experience? It is that, however toxic the contents may be, they are not absorbed by the intestinal veins, at least not in a noxious state.

In fact, I have in practice proceeded a stage further. In conditions of acute intestinal obstruction, where the cause was not removable at the time owing to the extreme condition of the patient, but offered a good prospect of successful removal in a few days, I have contented myself with draining the peritoneum in the neighbourhood and giving morphine. It is almost incredible how the severe symptoms abate; the patient becomes quite comfortable in the interval between the two operations, in spite of the fact that no attempt has been made to relieve the obstruction. In one patient that I assisted Mr. Cardew with—including the days of "acute obstruction," the interval, and the days following the second operation—there was no passage of the "bowel contents" for ten days, yet in the last seven of these, after drainage of the peritoneum, etc., there was not the slightest sign of toxaemia. The advantage of operating through the original and uninfected wound is obvious.

To take analogous cases, for example, acute suppurative pyosalpinges—cases which, by the way, are frequently mistaken for acute intestinal obstruction, owing to the absence of rigidity and temperature. I have seen many of them admitted into the General Hospital, Cheltenham, in such a state that any prolonged operation, such as the removal of the distended tubes, would mean certain death. It has been the practice of my colleagues and myself for some years to content ourselves at the time with simply placing a large drainage tube down to Douglas's pouch—a procedure taking five minutes—and removing the offending structure at leisure after an interval varying from three days to three weeks. I do not remember any case being lost where this was done, and yet on admission they were far the most acute. One case under my colleague Mr. Holmes was said to be "moribund."

The upshot of all this is that the seat of the absorption of toxins is the peritoneal cavity. I have already published my views as to how they get there.[1] To put them briefly: In health organisms permeate through the intestinal wall into the peritoneal cavity, a trap specially designed to receive and annihilate them, with its own excretory apparatus, the liver and intestines, so arranged that their poisonous excretions are not admitted into the systemic vessels. In disease such as intestinal obstruction the number and virulence of the organisms in the afferent intestine are increased enormously, permeation of these into the peritoneal cavity is excessive, and throws an increased strain upon the peritoneal excretory machinery, as evidenced by the copious vomiting, fatty degeneration of the liver cells, dryness of the tissues, etc., for a detailed explanation of which I must refer readers to my papers. In my statement that the peritoneal cavity is infected most experimental pathologists are against me; but clinical experience, as shown by the above cases, is in my favour. "The peritoneal exudate is sterile," they say. I remember the time when laboratory experiments "proved" that the hands could be made "sterile" by various methods; nevertheless in practice surgeons found it safer to use gloves. Things are not always so sterile as they seem.

I take exception to Mr. Wilkie's statement that the higher reaches of the intestine contain fewer organisms than the lower, for clinically one knows that a gastrojejunostomy requires much greater care to avoid infection of the peritoneum than a lateral anastomosis of the colon or ileum. I suggest that the reason for this is that a great many more varieties of pathogenic bacteria are to be found in the upper intestine than in the lower, where they fail to survive in the struggle for existence with the habitual dwellers of the latter, with which the host has a sort of working agreement. "But culture tubes fail to show their presence." That only suggests to me that the fault lies with the material of which the culture medium is composed; it is not a suitable one. Bacteriology is, after all, still a young science, and has not yet discovered the kind of bait which will attract every kind of organism in the intestine. The difference, then, between the symptoms of high and low obstruction (after all only one of degree) will be accounted for by the larger number of foreign organisms which permeate into the upper reaches of the peritoneal cavity; Nature in her wisdom has thought fit to partly innervate this region directly from the medulla itself; the call on the excretory machinery is, therefore, more instant and urgent, and the symptoms, the evidence that this machinery is working, are more severe.

I should be glad to know from Mr. Wilkie what exactly he means by "peritonitis" in conclusion 5. If he means inflammation of the peritoneal membrane, then what is the mechanism by which such an inflammation kills? Is it by the absorption of toxins into the systemic vessels or by reflexly causing cardiac inhibition?—I am, etc.,

Cheltenham, Oct. 29th. JOHN HOWELL, M.B., F.R.C.S.

[1] BRITISH MEDICAL JOURNAL, September 21st, 1912; *Lancet*, October 25th, 1913; and *Trans. Med. Soc. of London*, 1913.

RADIO-ACTIVE EXHIBITS AT THE SAN FRANCISCO EXHIBITION.

SIR,—The Special Commission appointed in Germany to prepare the Exhibition of "Radio-activity" in San Francisco, 1915, heartily invites the co-operation of those interested in England in radio-active research, and in all branches of industry—mining, radio-active springs, apparatus, etc.—connected with radio-activity. According to our present scheme the exhibition (for which a special house will be built) will contain the following departments:

1. Historical review (discovery of radio-activity—Becquerel, Roentgen, fluorescence, absorption of light, etc.).
2. Extraction of radium and other radio-active elements—mining, chemical process, etc.
3. Radio-active ores.
4. Physical properties of radio-active matter.
5. Chemical properties of radio-active matter.
6. Biological properties of radio-active matter.
7. Radio-active therapeutics (external and internal), cancer research.
8. Means of measuring radio-activity.
9. Radio-active springs (models, etc.).
10. Metamorphosis produced by radio-activity according to Ramsay and others.
11. Geography of radio-activity.
12. Scientific and popular lectures; courses and practical work.

I do not need to dwell on the importance of the proposed exhibition, but I should like to accentuate the fact that only a hearty co-operation of the nations principally interested—Germany, England, Austria, and France—can secure a result worthy of the great purpose.—I am, etc.,

Dr. C. ABEL-MUSGRAVE,
Chairman, German Commission (permanent office, Palast Hotel, Wiesbaden).

6, D'Aubigny Road, Brighton, Nov. 6th.

NATHANIEL ALCOCK MEMORIAL FUND.

Sir,—Some months ago you were kind enough to insert an appeal for subscriptions in aid of the family of the late Professor Alcock. Owing to his early death, he had been unable to make any provision for his family, and it was felt that the most appropriate form of memorial to his memory would be a fund to enable his three daughters and one son to receive an adequate education. A list of the subscriptions received to date is given below. Since we desire to close the fund before Christmas, in order that it may be invested and the proceeds applied to the object mentioned above, we should be glad to receive any further subscriptions to the fund as soon as possible. Contributions may be sent to either of the undersigned. Cheques should be crossed "Alcock Memorial Fund."—We are, etc.,

E. H. Starling,
Institute of Physiology, University College, London, N.W.

A. D. Waller,
Physiological Department, University of London, South Kensington, London, S.W.

November 7th.

List of Subscribers.

	£	s.	d.
Dr. H. K. Abbott	10	0	0
Rev. T. K. Abbott	20	0	0
Professor Adami, F.R.S.	10	0	0
Mrs. Alcock	10	0	0
Anonymous	500	0	0
Anonymous	50	0	0
Anonymous	0	12	6
Mrs. Ashe	5	0	0
Miss Ashe	0	10	0
Professor Bainbridge	1	1	0
Mrs. Baines	5	5	0
Dr. J. W. Barrett	2	2	0
Mrs. B. M. Bates	20	0	0
Professor Bayliss, F.R.S.	20	0	0
Dr. Wallace Beatty	2	2	0
Professor Boycott	5	0	0
Sir J. Broadbent	10	10	0
Dr. Burch, F.R.S.	2	0	0
Mr. W. Burridge	1	1	0
Mrs. L. M. Carver	100	0	0
Miss Dorothy Carver	50	0	0
Miss E. M. Carver	5	0	0
Miss Gertrude Carver	50	0	0
Professor Cash, F.R.S.	2	2	0
Professor Cathcart	1	1	0
Lord and Lady Courtney	50	0	0
Dr. W. Cramer	10	0	0
Sir William Crookes	10	0	0
Professor Cushny, F.R.S.	5	0	0
Dr. H. H. Dale	5	0	0
Mrs. Davies	1	1	0
Mr. R. Newton Davies	2	2	0
Mr. S. Arthur Davies	0	10	6
Professor H. R. Dean	1	1	0
The Dean of Durham	10	0	0
Dr. Ellison	1	1	0
Dr. Funk	2	2	0
Captain Gatney	1	0	0
Miss Gore	0	10	0
The Misses Gore	2	2	0
Mrs. F. A. Green	1	11	6
Mr. W. H. Clayton Greene (annual subscription)	5	5	0
Right Hon. Viscount Haldane, F.R.S.	25	0	0
Dr. J. S. Haldane	5	5	0
Dr. A. D. Hall	5	0	0
Professor Halliburton, F.R.S.	10	10	0
Dr. Hartley	2	2	0
Professor Yandell Henderson (20 dollars)	4	0	0
Mr. Albert Hill	20	0	0
Mrs. Berkeley Hill	50	0	0
Miss Florence Hill	1	0	0
Professor Leonard Hill, F.R.S.	10	10	0
Mr. Maurice Hill	200	0	0
Mr. M. D. Hill	5	0	0
Mrs. Holland	10	0	0
Sir Victor Horsley, F.R.S.	10	0	0
Mr. A. Hurd	5	5	0
Dr. Kennaway	1	1	0
Mrs. Kingsmill	5	0	0
Miss C. A. Kingsmill	25	0	0
Miss E. E. Kingsmill	25	0	0
Rev. Dr. Kingsmill	30	0	0
Dr Laird	0	10	6
Dr. Levy	2	2	0
Mr. Carvill Lewis	20	0	0
Dr. J. Little	5	5	0
Dr. Locke	5	5	0
Dr. Haynes Lovell	1	0	0
Dr. Luff	2	2	0
Dr. Roche Lynch	1	1	0
Professor Macleod	2	0	0
Professor Marshall	1	1	0
Dr. C. J. Martin, F.R.S.	10	0	0
Lieut.-Col. McCreery	5	0	0
Dr. McNeight	2	2	0
Dr. Menzies	3	3	0
Dr. J. H. Milroy	1	1	0
Professor T. H. Milroy	2	2	0
Dr. Moorhead	2	2	0
Dr. Mott, F.R.S.	3	3	0
Professor Myers	3	0	0
Mrs. Frazer Nash	1	1	0
Dr. George Oliver	3	3	0
Mrs. Oliver	50	0	0
Professor Osborne	5	5	0
Mr. H. Page	5	5	0
Mr. William Page	5	0	0
Mrs. Penrose	50	0	0
Dr. Pringle	20	0	0
Professor Purser	21	0	0
Mrs. Ramsden	20	0	0
The Misses Rhys	20	0	0
Dr. Roaf	5	0	0
Dr. L. Rogers	2	2	0
Sir Edward Schäfer, F.R.S.	10	10	0
Professor Schryver	3	3	0
Dr. Sheppard	5	0	0
Prof. Sherrington, F.R.S.	3	3	0
Dr. Sikes	1	1	0
Dr. Sutherland Simpson	5	0	0
Professor Lorrain Smith, F.R.S.	2	2	0
Professor Spearman	1	1	0
Dr. Spencer Scott	100	0	0
Dr. Spilsbury	2	2	0
Dr. Spriggs	1	1	0
Professor Starling, F.R.S.	10	0	0
Professor and Mrs. Peter Thompson	2	2	0
Dr. May Thorne	10	0	0
Professor Trouton, F.R.S.	25	0	0
Dr. Vernon	2	2	0
Mr. S. Wadsworth	20	0	0
Professor and Mrs. Waller	25	0	0
Mr. Harry Walters	10	10	0
Dr. Willcox	30	0	0
Sir Almroth Wright, F.R.S.	15	15	0
A Friend	5	0	0
Total subscriptions received to date	£2,010	13	0

ACUTE DILATATION OF THE STOMACH.

Sir,—The carefully reported case of acute dilatation of the stomach, occurring in the course of an operation for duodenal ulcer, that is narrated by Mr. Richardson in the British Medical Journal of November 8th (p. 1202) is of particular interest to those who have maintained, in spite of no little gentle ridicule, that in certain conditions gas distending the stomach is neither derived from fermenting food materials, nor swallowed from the air.

Many of those who have paid attention to the subject are convinced that, oftentimes, such gas is dissociated from the blood circulating in the stomach walls, and "secreted" into the cavity of the viscus. In these cases the gas appears usually to be imprisoned by spasm at the pylorus and at the cardia, that is relaxed when acapnia, from lowering of the CO_2 content of the blood, becomes marked, or may be inhibited by those purposive attempts at "swallowing" which, when perpetuated as a "habit," are dignified by the name of "aërophagia."—I am, etc.,

London, W., Nov. 8th. F. G. Crookshank.

YEAST INFECTION IN CHILDREN.

Sir,—Dr. R. Craik, writing in the Journal of November 8th about a case in which he identified the "thrush parasite" in the faeces of an infant, makes the following statement with reference to the organism in which he is interested:

> On culture media the organism often appears in the yeast conidial form only, and may be mistaken for a saccharomyces. Thus on isolating it from an inflamed gum, Mr. K. Goadby named it *Sac. neoformans*. On meeting with it in a case of sore throat, Mr. A. G. R. Foulerton named it *Sac. tumefaciens albus*, and described it at length.

In a similar irresponsible passage Dr. R. Craik deals with the work of an unnamed "French mycologist," who, according to Dr. R. Craik, was entirely wrong as to the identity of the organism with which he was working. "It is certain that the organism with which he worked was not the common thrush parasite at all." It may be that it is taking the matter too seriously to remind Dr. R. Craik that something more than bald assertion, unsupported by any statement of fact, is required when criticizing the work of others. But it may be mentioned that *Saccharomyces neoformans*, described by San Felicé at some time about the year 1894, was certainly not the common thrush parasite; and in stating this I have the advantage of having examined cultures of the yeast received directly from Professor San Felicé. Also Dr. R. Craik's statement, so far as it refers to my own work, is wholly inaccurate, and, if it had been made with any authority, would have been very misleading. If Dr. R. Craik will consult the paper which he quotes (the title of the paper happens to have been "On the Pathogenic Action of the Blastomycetes," and not "Experimental Blastomycosis," as Dr. Craik writes) he will find that pages 38 and 39 are occupied by some consideration of the "thrush parasite," which was described, in accordance with nomenclature current in 1899, when the paper was written, as *S. albicans* (vulg. *Oidium albicans*), and that the "yeast forms" and the "mycelial forms" of the parasite were referred to in some detail. If Dr. Craik will turn to page 49 of the same paper he will see it stated expressly that "mycelial forms" of *Saccharomyces tumefaciens* do not ever occur in growth on artificial media. And on reference to page 59 he will see that I was at some pains to explain that certain "pseudo-mycelial" forms which were seen in the granulomata which resulted from the inoculation of rabbbits with the yeast did not represent a true mycelium, but were produced by degenerative changes in short chains of the yeast cells. Dr. R. Craik's statement as to the identity of *Saccharomyces tumefaciens albus* is, in fact, a purely imaginary one.—I am, etc.,

London, W., Nov. 8th. Alex. G. R. Foulerton.

DR. LEFTWICH'S *TABULAR DIAGNOSIS*.

Sir,—I am far from complaining of a review which describes the tables in this work as having been "compiled with care," but, in the example given (Table 155) there is a misprint which as given would show want of care. The table contrasts scrotal hernia with hydrocele, and the reviewer is made to say: "Opposite onset we get under scrotal hernia 'sudden', and under hernia 'slow'; opposite impulse on coughing, in the former condition, 'present', in the latter 'absent'". The second heading "hernia" should, of course, have been "hydrocele," but in these hurried times the mistake may be charged to me, so I hasten to put the matter right.

As to "laboured elegancies of style," I did not disclaim them; I said that those who liked them could fill them in for themselves. Again, it was not "signs" that I described as "rare only because they are often unrecognized," but diseases.—I am, etc.,

November 8th. The Author.

THE ANNUAL MEETING AT THE ROYAL COLLEGE OF SURGEONS OF ENGLAND.

SIR,—This meeting will take place on Thursday, November 20th. One cannot call it a meeting of the Members of the College, as the Members are gradually but surely becoming alienated from their College by the persistent refusal of the Council to acknowledge the just claims of the Members for representation, and by the utter contempt with which the Members are treated when they do attend. The College of Surgeons does not consist merely of the Council or of the bricks and mortar in Lincoln's Inn Fields, but it does consist of its Fellows and Members all over the wide world, and it is by their steady plodding and persevering industry and skill that the College bears its great name all over the civilized globe, and not due to the mere handful of men on the Council. The Members are trusted with the vote for their country. Why are they refused a vote for their own College?

What has the Council done for the Members in the recent trying ordeal through which we have been and are still passing under the confiscatory Insurance Act?

I notice that the Council, in conjunction with the Royal College of Physicians, has withdrawn the embargo against the use of the title of "Doctor." Will they protect their Members and licentiates in the event of any of the universities commencing legal proceedings for the illegal use of medical titles?—I am, etc.,

Putney, S.W., Nov. 10th. A. S. MORTON, M.R.C.S.Eng.

Universities and Colleges.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.

THE ANNUAL REPORT.

THE annual report of the Council for the year 1913, which will be presented to the meeting of Fellows and Members at the Royal College of Surgeons, Lincoln's Inn Fields, on Thursday next, November 20th, at 3 p.m., has been issued. The agenda of the meeting will be supplied by the Secretary of the College on application to him on or after November 17th.

RECORD OF THE YEAR'S WORK.

The three resolutions passed at the annual meeting last year are set out. The first approved and endorsed the action of the Council in reference to the National Insurance Act; the second demanded the admission of Members to direct representation on the Council; and the third expressed the regret of the meeting that the Council did not call a special general meeting of Fellows and Members to consider the National Insurance Act. In its remarks on these resolutions the Council expresses its satisfaction that its action referred to in the first resolution had met with the approval of the meeting. In regard to the second resolution, the Council does not think it necessary to make any statement supplementing what was set forth in the annual report for the year 1907.

National Insurance Act.

Reference is made to further meetings of the Joint Committee of the Royal Colleges of Physicians and Surgeons, the Society of Apothecaries, and the Medical Faculties of the universities. On November 13th, 1912, resolutions were passed objecting to the provisional regulations of the Insurance Commissioners as being of a nature to interfere with the rights and independence of medical practitioners, calling attention to the necessity of the tribunal which has to deal with matters affecting the professional conduct of medical practitioners being composed of members of the medical profession, and expressing the opinion that, since the carrying out of the provisional regulations is left largely in the hands of the Local Insurance Committees, it would be unwise to agree to accept them, so long as the insured persons represented on these committees be a large majority. A fourth resolution was passed urging the establishment of tuberculosis centres in connexion with hospitals to which medical schools are attached. Owing chiefly to the late period of the parliamentary session, it was not deemed that any useful purpose would be served by presenting a memorial. The Insurance Commissioners have notified the Council that resident medical officers at hospitals are not required to insure under the Act. An inquiry was received from the London Medical Committee in regard to the attitude of the College toward medical practitioners who might become members of a registered trade union. At its meeting in April the Council replied as follows:

That, inasmuch as there is nothing in the charters or by-laws to prevent a Fellow or Member joining a registered trade union, the formation of such a union by members of the medical profession does not in itself appear to the Council to be a matter to which they can raise objections; and that the view which the Council might take of the conduct of any Fellows or Members in joining such a union, or taking part in i s affairs, would depend on the objects with which it is formed and the methods it adopts to attain such objects.

Primary Examination for the Fellowship.

Certain alterations that have been made in the regulations relating to the physiological portion of the examinations for the Fellowship, are detailed, and it is stated that the new regulations will be carried out at the examination to be held in May, 1914.

Licence in Dental Surgery.

Candidates for the licence in dental surgery will in future be required to pass the preliminary science examination before proceeding to study for the second professional examination.

Diploma in Tropical Medicine and Hygiene.

The short title of the diploma in tropical medicine and hygiene has been altered to "D.T.M.and H.England."

The Title of "Doctor."

Attention is drawn to the fact that the by-law of the Royal College of Physicians objecting to the assumption of the title of "doctor" has been amended.

Prizes.

The Jacksonian Prize has been awarded to Mr. Francis Willoughby Goyder, M.B., F.R.C.S., for his essay on the embryology and treatment of cleft palate; and the Triennial Prize and John Hunter Medal to Dr. W. Blair Bell for his essay on the anatomy, physiology, and pathology of the pituitary body. Fleet Surgeons R. C. Munday and E. Sutton have received the Sir Gilbert Blane Medals.

Schiff Home of Recovery.

Mr. G. H. Makins, C.B., was appointed the representative member of the College on the Managing Committee of the Schiff Home of Recovery. This home was founded and endowed by Sir Ernest Frederick Schiff "for t reception and accommodation of poor persons of eith sex who are suffering from wounds, the result of accident or operation, which still require surgical supervision and nursing, and who have been under treatment for the accident or operation as in-patients at one of the following London general hospitals: Charing Cross Hospital, Guy's Hospital, King's College Hospital, the London Hospital, Middlesex Hospital, St. Thomas's Hospital, and University College Hospital."

Portraits.

A replica of the portrait, by the Hon. John Collier, of the late Sir Henry T. Butlin, Bart., has been presented to the College by Lady Butlin. The College has acquired a portrait of Mr. Pennell Hawkins, Master of the Company of Surgeons in 1778, painted by Zoffany.

Centenarian Member.

The congratulations of the College were sent to Surgeon-Major H. B. Hinton, of Adelaide, South Australia, on his attaining the age of 100 years.

The Central Midwives Board.

The report of Mr. Golding-Bird (who has been reappointed a member of the Central Midwives Board) for the year 1912 stated that the chief matter of interest dealt with arises from a complaint from a midwife of a circular issued by the Chesterfield Division of the British Medical Association, setting forth the conditions under which practitioners of the district would be prepared to attend to a maternity patient in response to a summons of a midwife. The Central Midwives Board regretted the publication of this document to its midwives, and stated that where a midwife had obeyed the rules of the Board she had discharged her duty to the patient. The Board stated that it had no authority over medical practitioners, and had forwarded the correspondence to the Privy Council.

The statistics of the Board showed that 35,210 midwives were now on the roll, of whom only 1,813 had passed the examination; 45 midwives had resigned, 91 had been struck off the roll as the result of the hearing of penal cases, and in 8 cases the sentence has been postponed or the hearing adjourned.

Finance.

The balance sheet of the College shows an improvement over previous years. On the expenditure side there is a decrease of £1,508. This is partly due to a decrease of £120 in respect of examiners' fees and of £885 in respect of half of the expenses at the Examination Hall. Various items show smaller decreases. The total amount of expended moneys is £22,261. The income of the College has increased by £539 from last year, it being £26,379, giving a balance of income over expenditure of £4,117, which is the largest balance in any one year since 1887-8.

Museum.

No alterations of consequence were undertaken in the museum during the past year. A large number of new specimens were added, and various parts of the collection rearranged and recatalogued. Mr. Alban Doran has completed a catalogue of and guide to the gynaecological series and has prepared a descriptive catalogue of the large collection of obstetric instruments. Good progress has been made in the work of the Conservator in the osteological department of the museum. The aim of this department has been to provide material from which the skeletal development of past generations of the inhabitants of this country may be studied in such detail as to enable the question whether the present race is degenerating or not to be answered. A number of valuable additions has been made to this collection, all of which have been carefully studied and classified. The museum has been visited by an increasing number of students and others. Various classes have been admitted to the museum, and while it is felt that the College has conferred a material service to the community by admitting these classes, the demands for admission have been so great, that it will become necessary to exercise a strict supervision on the number, in order that the value of these visits may not be impaired.

Examinations and Diplomas.

Of 240 candidates examined for the Fellowship, 75 passed and no less than 165 were referred at the First Examination, 118 presenting themselves for the Final, 63 passing, 46 being referred for six months and 9 for a year; 334 candidates were examined in Anatomy and Physiology by the Conjoint Board, 190 passing, while 144 were referred; 617 were examined at the Final in Medicine, 225 being referred; 697 in Surgery, 295 being referred, and 569 in Midwifery with 190 rejections; in the Public Health Diploma 74 candidates presented themselves for the first part, 25 being referred and 44 approved at the second part of the examination, 11 being referred; 6 candidates were examined for the Diploma in Tropical Medicine, 2 being referred; out of 176 of the candidates for the Licence in Dental Surgery examined in General Surgery 64 were referred, and out of 165 examined in Dental Surgery 52 were referred.

The Honorary Secretary of the Society of Members of the Royal College of Surgeons of England informs us that Dr. Oldfield had, on behalf of the society, given notice of the following motion, which had been ruled by the President to be out of order on the ground that the meeting has no power to give authority for the appointment of a committee as proposed:

> That a committee be forthwith appointed to inquire into the financial position of the College of Surgeons of England, and into the expenditure of its moneys by the Council during the past three financial years; that the committee shall consist of eight members, four of whom shall be appointed by the Council at the next meeting of the Council, and four by the executive committee of the Society of Members of the Royal College of Surgeons of England; that the first meeting of this committee shall be held before December 25th next; that it shall meet as often as required and report to the next annual meeting of Fellows and Members at the College.

UNIVERSITY OF LONDON.

MEETING OF THE SENATE.

A MEETING of the Senate was held on October 22nd, when the Vice-President, Dr. Herringham, presided.

Recognition of Teachers.—Dr. Julius M. Bernstein was recognized as a teacher of forensic medicine at the Westminster Hospital Medical School.

London County Council Grant to King's College.—The Academic Council reported that the London County Council had made a grant of £3,000 to King's College in respect of the financial year 1914-15 for the equipment of the rooms vacated by the removal of the Strand school. The Senate directed its thanks to be conveyed to the London County Council for their generous grant.

Report of Professor of Protozoology.—The Senate received the report of the Professor of Protozoology giving details of the research work now in progress, and also particulars with regard to teaching work. The report also contained a list of works published from the department.

B.Sc. Honours Degree in Anthropology.—The following were approved as subsidiary subjects for the B.Sc. Honours Degree in Anthropology for external students: Psychology, geology, zoology, and physiology.

University Site.—A request from the London County Council to be afforded an opportunity of considering the financial aspect of any removal of the University from its present buildings was referred to the Site and Accommodation Committee.

Advanced Lectures in Medicine.—The course of three post-graduate lectures on the causation of insanity announced to be given during November by Dr. Robert Jones will not be given this session. A course of three lectures on enteric fever will be given at the Royal Army Medical College, Millbank, by Major S. Lyle Cummins, M.B., B.S., on December 1st, 3rd, and 5th, at 5 p.m. The lectures will be free without tickets to advanced students of the university and to others interested in the subject.

UNIVERSITY OF GLASGOW.

UNIVERSITY COURT.

A MEETING of Glasgow University Court was held at the College, Gilmorehill, on November 6th, when Sir David McVail presided, in the absence of the Principal, owing to illness. Reference was made to the illness of Sir Donald MacAlister, and to his satisfactory progress towards health again.

The Gavin Tennent Bequest.

The Secretary read a communication intimating the bequest of the late Dr. Gavin P. Tennent of £25,000 (as already reported) to be applied for such objects in connexion with the Faculty of Medicine as his trustees might determine, and subject to such conditions as they might prescribe. A small committee was appointed to confer with Dr. Tennent's trustees, and report.

The Preliminary Examination Ordinance.

A communication from the General Council of the University regarding the preliminary examination ordinance (as reported in our last week's issue, p. 1259) was submitted, and it was agreed to inform the Senate of the views of the General Council, and invite them to transmit their views to the court.

Professor Bower.

Professor Bower's resignation as a member of the court having been intimated, the Chairman expressed the regret of the members that they were not to have Professor Bower as a colleague on the court, and hoped that at no distant date he might return as a member.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS, GLASGOW.

THE annual meeting of the Fellows of the Royal Faculty of Physicians and Surgeons, Glasgow, was held on November 3rd, when the following were among the office-bearers elected for the ensuing year:

President.—Dr. John Barlow.

Visitor.—Dr. Ebenezer Duncan.

Councillors.—The President, *ex officio;* the Visitor, *ex officio;* the Treasurer, *ex officio;* Mr. D. N. Knox, as representative to the General Medical Council; Dr. Alexander Napier, Dr. A. Maitland Ramsay, Dr. George Halket, Mr. Donald Duff, Mr. J. Walker Downie, Dr. David Newman, Dr. W. G. Dun, Treasurer; Dr. Alexander Napier, Honorary Librarian.

Representative on the General Medical Council.—Mr. D. N. Knox.

Medico-Legal.

TREATMENT BY RADIUM.

THE following report of the case of Treves and others *v.* the British Oxypathor Company, heard before Mr. Justice Sargant in the Chancery Division on November 7th, was published in the *Times* of the following day:

This was a motion in an action by Sir Frederick Treves, the Hon. Walter Guinness, M.P., Mr. Felix Cassel, K.C., M.P., and Mr. A. E. Hayward Pinch, suing on behalf of themselves and all other persons concerned or engaged in carrying on the Radium Institute, against the British Oxypathor Company (Limited), trading as the Radium Oxygen Institute, and its directors.

Mr. Mark Romer, K.C. (Mr. McCardie with him), for the plaintiffs, said that although the action was for an injunction the defendants had submitted to give an undertaking.

Mr. Dighton Pollock was for the defendants.

The order taken was that (the defendants undertaking that they, their servants or agents, would not use or carry on business under the name of "The Radium Oxygen Institute," or any name comprising the words "Radium Institute," likely to mislead or deceive the public into the belief that the business carried on by them was the same as or in any way

connected with the business carried on by the plaintiffs, and would not in any manner advertise or hold out the business carried on by them as the business of or as a business connected with the business carried on by the plaintiffs, and the defendants further undertaking that they, their servants or agents, would not infringe or continue to infringe in any manner the copyright of the plaintiff Pinch, or of the plaintiffs, in a publication called "A Report of the Work carried out at the Radium Institute from August 4th, 1911, to December 31st, 1912," and the defendants stating and undertaking that they had destroyed all advertisements and other publications which infringed copies of the said publication which had been in their possession since the service of the writ, and that they would destroy all further infringing documents which might come into their possession) the hearing of the motion should be treated as the trial of the action, and that the defendants should pay to the plaintiffs their costs of the action, and that all further proceedings therein, except to give effect to the order, should be stayed.

Solicitors.—Messrs. Lewis and Lewis; Mr. Guilford E. Lewis.

SALE OF PRACTICE.

(1) C. asks whether, in selling the share of a medical practice, it is usual to sell on a three years' average of the gross or net receipts.

(2) X. Y. Z. asks what a partner ought to pay for (*a*) half profits, (*b*) for one-third profits.

*** (1) In estimating the value of a practice it is always customary to take the gross and not the net receipts.

(2) The average value of a half or third share of a practice is from one to three years' purchase, according to the character of the practice—that is, a purchaser would have to pay a sum of money equal to the income derived from the share during one to three years, as the case might be. The gross income, and not the profits, is the basis usually taken for estimating the value of a practice or a share of the same.

Public Health AND POOR LAW MEDICAL SERVICES.

INDUSTRIAL INFECTION BY ANTHRAX.

THE Home Secretary has appointed a committee to inquire into the dangers from infection by anthrax in the processes of sorting, willeying, washing, combing, and carding wool, goat hair, and camel hair, and in the processes incidental thereto; and to consider and report whether any, and, if so, what amendments are desirable in the regulations for these processes made under Section 79 of the Factory and Workshop Act, 1901. The Committee is constituted as follows:

The Right Hon. Sir Thomas P. Whittaker, M.P. (Chairman).
Mr. W. Barber, Secretary to the Bradford Trades and Labour Council.
Dr. F. W. Eurich, professor of forensic medicine in the University of Leeds, bacteriologist and pathologist to the city of Bradford, and bacteriologist to the Anthrax Investigating Board, Bradford and districts.
Alderman J. E. Fawcett, President of the Bradford Chamber of Commerce and Chairman of the Anthrax Investigation Board.
Colonel E. H. Foster.
Mr. T. Grundy, Secretary to the National Union of Woolsorters.
Dr. T. M. Legge, one of His Majesty's Medical Inspectors of Factories.
Mr. Ernest Marsh; and
Mr. S. Parker, Secretary to the Bradford and District Wool Top and Noil Warehousemen's Union.

The Secretary to the Committee is Mr. G. E. Duckering, one of His Majesty's Inspectors of Factories; and any communications on the subject of the inquiry may be addressed to him at 72, Bridge Street, Manchester.

HOUSEHOLDERS' RIGHTS IN RESPECT TO SEWAGE.

T. S. E.—Section 21 of the Public Health Act, 1875, entitles the owner or occupier of premises to cause his drains to empty into the sewers of a sanitary authority provided he complies with the regulations of the authority with respect to such sewers. Section 15 of the same Act reads: "Every local authority . . . shall cause to be made such sewers as may be necessary for effectually draining their district for the purposes of this Act." These sections are commented on in Lumley's *Public Health*, published by Shaw and Sons, London.

Obituary.

ALFRED RUSSEL WALLACE.

BORN JANUARY 8TH, 1823; DIED NOVEMBER 7TH, 1913.

ALFRED RUSSEL WALLACE is dead. What a host of reminiscences this short sentence recalls to mind! The last of that band of great biologists of the last century and the last of the pall-bearers at the funeral of the immortal Charles Darwin is no longer with us. His death brings back to memory the names of his distinguished colleagues of a bygone day, Darwin and Huxley, Lyell, Hooker, Spencer, and Owen. A band of scientific workers of which any country may well be proud, for did they not all play a leading part in the great controversy which centered around the doctrine of evolution?

Born at Usk in Monmouthshire on January 8th, 1823, Wallace had reached the ripe age of almost 91 years when he died on November 7th at the little village of Broadstone in Dorsetshire. Even in the early days of his boyhood certain of the mental characteristics which marked his later years were seen in their inception. Though unable for many years to visualize his parents or any of the persons with whom he was in daily contact, he could readily recall all the natural surroundings of his former home. Then, as throughout life "the perception of form and individuality were but moderately developed, while locality, ideality, colour and comparison are decidedly stronger" as he himself once wrote. At this time, too, he was haunted by an oft-repeated dream of a creature with huge wings coming nearer and nearer to the house and finally clinging to it. Thus early is revealed the type of mind which in later years found expression in spiritualism. His boyhood was passed at Hertford, where he was educated. On leaving school, Wallace was apprenticed in London to a small master-builder. His intercourse with artisans turned his thoughts into the channel of social problems, and he became keenly interested in the activities of the Secularists and Owenites.

In 1837 he commenced his education as a land surveyor under his brother, and this work led him to spend some years in Wales, the natural beauties of which were an abiding source of enjoyment. Here, too, the "land problem" attracted his attention. His sojourn in Wales was interrupted for a brief period by undertaking a post of assistant master at a school in Leicester. During this time he became interested in psychical research, a subject which, as he says, "played an important part in his mental growth."

It was on his return to his former occupation in Wales that Wallace seems to have been more particularly attracted to natural history, and during this period was in constant communication with Bates, chiefly on the subject of insect collecting. Such books as the *Vestiges of Creation* and *Cosmos* led him to speculate, even at this comparatively early age, on the origin of species; but it was the publication of *A Voyage up the Amazon*, by W. H. Edwards, in 1847 which determined him to visit South America. In the following year he set sail in the *Mischief*, a barque of 192 tons, and with his embarkation his life as a naturalist of the first rank may be said to have commenced. During his four years' absence he sent home many communications to scientific societies. On the homeward voyage the ship caught fire; the passengers and crew were forced to abandon her, and, in addition to the hardships and privations they underwent, Wallace had the added disappointment of the loss of much of his collections.

It was at an evening meeting of the Zoological Society, two months after his return, that he first met Huxley. In February, 1854, Wallace sailed in the *Frolic* for his great expedition to the Malayan archipelago, which extended over eight years. It was here that he laid the foundation of the principles of geographical distribution, and which resulted in what has ever since been known as "Wallace's line." His mind always intent on the problem of the origin and immutability of species, he wrote his first communication on the subject at Sarawak. It appeared in the *Annals and Magazine of Natural History* in September, 1855. Pondering over these subjects and recalling certain facts which he had read many years before in Malthus's *Principles of Population*, the idea of the principle of

natural selection came to him as by a sudden inspiration. The joint production of a paper by Darwin and Wallace on this subject, which was communicated to the Linnean Society on July 1st, 1858, by Lyell and Hooker, forms one of the most dramatic incidents in the whole history of science, and the lifelong attitude of the two authors towards one another with regard to their respective merits in this discovery one of the most touching examples of magnanimity and of the truly scientific spirit.

With the subsequent history of Wallace's scientific career it is not necessary to dwell. In the later years of his life, while his interest in biological subjects in no sense abated, his thoughts became more and more diverted to social and spiritualistic problems. However much one may disagree with many of the views he latterly expressed, one is deeply impressed by the absolute sincerity of the man.

That Wallace was no believer in the mechanistic theory of life is amply proved in his book *The World of Life*, published three years ago. A life so long, so active, and so varied, cannot be dealt with in a small compass. Simple and unostentatious, he was a great man in the truest sense of the word. The whole scientific world joins with his relatives in mourning his loss; but it is thankful for his life, and finds consolation in the fact that at so great age we could not hope that he would have been with us for long.

DEATHS IN THE PROFESSION ABROAD. — Among the members of the medical profession in foreign countries who have recently died are Dr. Franz Auchenthaler, of Vienna, formerly physician to the Crown Prince Rudolf; Dr. Gulielmo Cantanaro, lecturer in pathology in the University of Naples; Dr. Rafael Ulecia y Cardona, founder and guiding spirit of the *Revista de Medicina y Cirugia Practicas;* Dr. E. Klebs, formerly professor of pathological anatomy in the Medical Faculty of Zurich; and Dr. Ramon de la Sota y Lastra, professor of surgical pathology in the Medical Faculty of Seville.

Medical News.

THE estate of the late Mr. Andrew Clark has been declared at a gross value of £21,320, with a net personalty equal to £17,407.

SIR WILLIAM CHURCH has been appointed a trustee of the Hunterian Museum, Royal College of Surgeons of England, to fill the vacancy occasioned by the death of Sir Jonathan Hutchinson.

A MEETING will be held on Tuesday, November 18th, at 11, Chandos Street, London, W., to discuss the position of medical officers in His Majesty's prisons. The chair will be taken by Dr. W. Hugh Fenton at 8.30 p.m.

THE Glasgow University Club, London, will dine at the Trocadero Restaurant, Piccadilly Circus, W., on Friday, November 28th, at 7.30 p.m., under the chairmanship of Sir William S. McCormick, secretary to the Carnegie Trust.

THE recent performance at the Coliseum for the joint benefit of Charing Cross Hospital and the French Hospital resulted in a sum of £5,000, of which £1,250 has been allotted to the French Hospital, and the rest to Lord Lonsdale's special appeal fund for Charing Cross Hospital. The allotment was made by Mr. Oswald Stoll and the other directors of the Coliseum syndicate.

UNDER the will of the late Mr. Oscar Lipscomb of Balham, King Edward's Hospital Fund for London and the London Hospital each receive a bequest of £1,000. Other bequests under the same will are £500 each to Guy's Hospital, Charing Cross Hospital, and the Bolingbroke Hospital, and a sum of £300 to the Royal Westminster Ophthalmic Hospital.

SIMULTANEOUSLY with the outbreak of scarlet fever in the north of Ireland to which our correspondents have recently called attention there was a marked rise in the notifications of the disease in London; they numbered 306 in the week ending September 13th and 700 in that ending November 1st; last week there was a decline to 549. There would appear to be an unusual prevalence of scarlet fever in the home counties also.

THE western district of the County Council of Dumbarton has inspected and passed the motor fire-engine and pump built by Argylls Limited at Alexandria, Dumbartonshire. The vehicle, which embodies the latest fire-fighting appliances, will be maintained at the Argyll Works under an annual subsidy, and will be ready for action day and night. The brigade is also drawn from the Argyll Works, and is captained by Mr. T. S. Mort, the works engineer.

THE medical group of the newly elected Italian Chamber of Deputies numbers thirty-six. This is exactly the same number as before, though some new members have taken the place of others who failed to secure return. Politically the group is made up of sixteen Liberals, ten Radicals, six official Socialists, two Constitutional Democrats, one Republican, and one Socialist Reformer.

AT the next quarterly meeting of the Medico-Psychological Association of Great Britain and Ireland, which will be held at the house of the Medical Society of London on Tuesday, November 25th, at 3 p.m., the adjourned discussion on Dr. Gettings's paper on asylum dysentery will be resumed. On the previous day, at 2.30 p.m., there will be a meeting of the Committee on the Status of Psychiatry in Great Britain and Ireland, and the reforms necessary in the education and conditions of service of assistant medical officers.

A CONFERENCE has taken place between the Higher Education Subcommittee of the London Education Committee and the Sites Committee of the University of London on the subject of the future accommodation of the University. The possibilities of a site on the banks of the Thames, such as Somerset House, and the prospect of continuance at the Imperial Institute were considered. Under a Treasury minute powers of extension exist at the Imperial Institute under the statutes and regulations made by the Commissioners. A report on the subject will shortly be presented to the London County Council.

IN the list of mayors elected on November 9th are the following members of the medical profession: Dr. R. Preston King, Bath; Dr. S. Hale Puckle, Bishops-Castle; Dr. James Robinson, Cardiff (Lord Mayor); Dr. S. R. Alexander, Faversham; Dr. R. Jones Evans, Pwllheli; Dr. J. P. Atkinson, Saffron Walden; Dr. John Rafter, Bootle; Dr. Walter E. Llewellyn Davies, Llanidloes; Dr. J. Lloyd Davies, Newport (Mon.); and Dr. A. W. Limont, Southport. On looking up the records of previous years we find that Dr. Alexander was elected Mayor of Faversham both last year and the previous year, and that the same remark applies to Dr. Atkinson of Saffron Walden. Nearly all these gentlemen are members of the British Medical Association, and some of them have at various times played an active part in its affairs. With one exception they are all still in practice.

AT the meeting of the Royal Geographical Society on November 10th, the first of the winter session, special medals were presented to officers and men who took part in the Captain Scott Antarctic Expedition and to the relatives of those who lost their lives. Lord Curzon of Kedleston, who made the presentations, recalled the fact that at the anniversary meeting in the summer the Society had presented to Lady Scott a casket to contain the medals won by her illustrious husband, and to Mrs. Wilson, the widow of Dr. E. A. Wilson, the gold medal of the society. The special medal now presented to all the officers and men of the party showed on one side a portrait of Captain Scott, and on the other a relief of that never to be forgotten party of five as they started on their last sleigh journey to the Pole. Among those who received the medal were Surgeon L. Atkinson, R.N., and Surgeon Levick, R.N.

The Services.

NAVAL MEDICAL CONSULTATIVE BOARD.

SURGEON-GENERAL JOHN DENNIS, M.D., has been appointed a naval member of the Naval Medical Consultative Board in place of Surgeon-General Howard Todd, C.B., K.H.S., retired. Sir John Tweedy, F.R.C.S., has been appointed a civilian member of the Naval Medical Consultative Board.

ROYAL ARMY MEDICAL CORPS.

THE King has granted the following officers permission to accept and wear the Orders indicated conferred upon them by His Highness the Khedive of Egypt in recognition of valuable services rendered: Captain John Powell, M.B., R.A.M.C. (Fourth Class Imperial Order of the Osmanieh), Captain Richard J. C. Thompson, R.A.M.C. (Fourth Class Imperial Ottoman Order of the Medjidieh).

Letters, Notes, and Answers.

ORIGINAL ARTICLES and LETTERS *forwarded for publication are understood to be offered to the* BRITISH MEDICAL JOURNAL *alone unless the contrary be stated.*

MANUSCRIPTS FORWARDED TO THE OFFICE OF THIS JOURNAL CANNOT UNDER ANY CIRCUMSTANCES BE RETURNED.

AUTHORS desiring reprints of their articles published in the BRITISH MEDICAL JOURNAL are requested to communicate with the Office, 429, Strand, W.C., on receipt of proof.

CORRESPONDENTS who wish notice to be taken of their communications should authenticate them with their names—of course not necessarily for publication.

CORRESPONDENTS not answered are requested to look at the Notices to Correspondents of the following week.

TELEGRAPHIC ADDRESS.—The telegraphic address of the EDITOR of the BRITISH MEDICAL JOURNAL is *Aitiology, Westrand, London.* The telegraphic address of the BRITISH MEDICAL JOURNAL is *Articulate, Westrand, London.*

TELEPHONE (National):—
2631, Gerrard, EDITOR, BRITISH MEDICAL JOURNAL.
2630, Gerrard, BRITISH MEDICAL ASSOCIATION.
2634, Gerrard, MEDICAL SECRETARY.

☞ *Queries, answers, and communications relating to subjects to which special departments of the* BRITISH MEDICAL JOURNAL *are devoted will be found under their respective headings.*

QUERIES.

C. R. asks what book to read, and at what institution to make a short visit, in order to rub up knowledge of the commoner forms of surgical tuberculosis.

W. asks for suggestions for the treatment of rectal pain coming on paroxysmally at frequent intervals—once or twice a day as a rule—and lasting an hour or so, in an otherwise healthy young woman. The pain first appeared in the puerperium, and is partially relieved by Bier's suction cup.

SCHOOLS FOR THE DAUGHTERS OF MEDICAL MEN.

WE receive from time to time inquiries as to schools for the daughters of medical men of moderate income. A school designed to meet this need was started a good many years ago, but was discontinued, and we have heard of no institution which takes its place. The Association of Head Mistresses issues a *Girls' School Year Book*, which gives information of a reliable character with regard to a large number of schools. It is published by the Year Book Press, 25, High Street, Bloomsbury, London, W., price 3s. 6d.

INCOME TAX.

A. R. has given notice of objection to his assessment, and has been informed by the income tax authorities that they cannot reduce the amount of his assessment without accounts for the three preceding years. The only accurate account which "A. R." can produce is that for the year ending October 31st, 1913.

*** The Income Tax Commissioners are entrusted with large discretionary powers of insisting on specified evidence as a condition precedent to the granting of relief on appeal. At the same time, "A. R." is entitled to attend the appeal meeting of the local commissioners, and put in (1) an account of his receipts and expenses for the year 1912-13, and (2) any evidence he may be able to adduce that his profits in that year were not less than in the previous years. On such evidence the Commissioners would be entitled to make any reduction that might seem to them to be just and reasonable, and, we apprehend, would be not unlikely to do so. The communication which "A. R." received was presumably from the surveyor of taxes, and he may have intended to imply that his personal power of reduction, and not that of the Commissioners sitting to hear appeals, is restricted by the absence of the full evidence of the correct liability.

LETTERS, NOTES, ETC.

APPARATUS FOR ARTIFICIAL PNEUMOTHORAX.

DR. S. VERE PEARSON asks us to state that the apparatus for the injection of nitrogen into the pleural cavity advertised by Messrs. Down Bros., in the JOURNAL of last week, under his name and that of Dr. Lillingston, does not incorporate various modifications and improvements described by Dr. Pearson in the JOURNAL of October 25th, p. 1098. Dr. Pearson states that from the outset he has invariably used movable bottles and siphonage, and has been opposed to the use of a hand bellows. Messrs. Down Bros. have promised Dr. Pearson to consult him with a view to learning what modifications he approves.

HERPES AND VARICELLA.

DR. E. ARTHUR DANDO (Dudley) writes: A week ago I was called to see a patient who was suffering from shingles; four weeks earlier I had been attending a son of this patient who was suffering from chicken-pox. In 1904, in the same house, I attended the wife of this man, who was then suffering from shingles; five weeks preceding this I attended the daughter of this lady, who was then suffering from an attack of chicken-pox.

DR. J. H. BARTLETT (Newbridge, Mon.) writes: In reference to the notes that have been appearing recently recording the connexion between herpes and varicella, about which up to now I have had my doubts, I should like to mention the following: On October 6th I was called to attend a lady who had a typical rash of herpes circinatus accompanied by considerable neuralgic pains; on October 26th one of the daughters developed a rash on face, chest, and back, which on October 27th had the distinct "shotty" feeling of chicken-pox. There are five other members of the family, but up to the present none of them have had any symptoms of chicken-pox; some of them have already had the disease.

THE EXECUTIONER SURGEON.

DR. JOHN DE ZOUCHE MARSHALL (Thames Ditton), in a letter on this matter, makes the following observations:

Will you allow me, as an old member of the British Medical Association (since 1870), to enter a protest against the language in which you have criticized a letter appearing in the *Pall Mall Gazette* of October 24th, from the pen of Mr. Filson Young, who is evidently interested in the reform of the present haphazard system of appointing executioners, and relying on them alone for carrying out "the last dread sentence of the law." I fail to see that he suggests making the prison surgeon into the actual hangman—merely that the medical officer should have the sole management (apportionment of drop, position of knot, etc.) of the operation, as it is well known that the hangman "wishes to be his own master," and does not "show a desire to comply with suggestions made by the surgeon or any other authority" (Report of Lord Aberdare Capital Sentences Committee, par. 702, page 25; J. Barr, M.D., March 23rd, 1886).

It is high time that the Home Secretary nominated another committee to inquire into the whole subject for, as I proved in the *Lancet* of March 1st by reports of executions taken from the *Standard*, since the 1886 Committee laid down its official scale of drops, that scale has been *absolutely ignored* since 1887, and only three-quarters of the drops allowed, thus killing by asphyxia instead of by dislocation. Again overwhelming evidence as to the deadliness of the submental knot has accumulated, the adoption of which would simplify matters.

Dr. Marshall offers to send a copy of the *Lancet* correspondence to any member of the profession interested on receipt of a stamped directed envelope.

DR. A. R. EATES commenting on the same subject asks whether the hangman and gaoler of our own time have as yet made any protest against the invasion by our profession into their sphere of activities by executing the Government's orders to feed forcibly women political prisoners? . . . "Looking at this question of forcible feeding from the purely medical point of view, and seeing, as one of your correspondents points out, that it has failed in its objects, I think the medical men who are called upon to perform the operation ought to refuse to continue to do what they have found to be useless, especially as the treatment amounts to torture. Why do not the prison doctors test the solidarity of their profession by downing stomach tubes? I am sure that such a strike would meet with nothing but sympathy from the whole community, and not a man in our ranks would be found to break the strike."

REX V. HAMILTON.

DR. W. H. GIMBLETT (36, Sutherland Avenue, Maida Vale, W.), whose appeal giving the names of the committee formed to raise a fund to reimburse Dr. Hamilton was published on October 25th, page 1118, acknowledges the following subscriptions in addition to the sum of £54 5s. already acknowledged: Dr. Vaughan Pendred (East Sheen), 10s. 6d.; Dr. Deane (Lincoln), £3 3s.; Dr. Denny (East Barkwith), £3 3s.

SCALE OF CHARGES FOR ADVERTISEMENTS IN THE BRITISH MEDICAL JOURNAL.

	£	s.	d.
Seven lines and under	0	5	0
Each additional line	0	0	8
A whole column	3	10	0
A page	10	0	0

An average line contains six words.

All remittances by Post Office Orders must be made payable to the British Medical Association at the General Post Office, London. No responsibility will be accepted for any such remittance not so safeguarded.

Advertisements should be delivered, addressed to the Manager, 429, Strand, London, not later than the first post on Wednesday morning preceding publication, and, if not paid for at the time, should be accompanied by a reference.

NOTE.—It is against the rules of the Post Office to receive *postes restante* letters addressed either in initials or numbers.